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January/February 2001  
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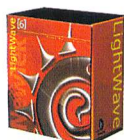


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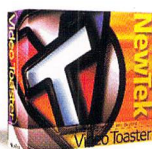
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# NewTekNIQUES

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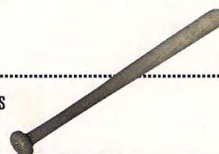
The A, B, C's of UV's

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**ON THE COVER:** Flame, updated in 6.5, was created by Matt McDonald originally for Twisted Metal 4; his warrior is from a game in development





# Impressions

A FEW WORDS FROM OUR EDITORS-IN-CHIEF

by Dick De Jong  
& Molly Dinkins

## 2001 and Beyond

**T**hirty three years ago, Stanley Kubrick's futuristic cinematic masterpiece was way ahead of its time, but this 2001 finds the latest sci-fi games looking sorely old fashioned. Without HAL's help, game players are still waiting for power, cost and speed to coalesce into virtual reality.

Though, by no means, has this dilemma deterred the games industry, which is quickly usurping Hollywood dollars and capturing the distinction of favorite family fun. According to a recent CNN business report, last year's game sales reached eight billion dollars with a twenty percent increase expected this year. Bill Gates, addressing the expanding market and Microsoft's upcoming Xbox, offered his assessment, "there's room for success here for everybody."

For a glimpse of the future of entertainment/games, experience Metreon next time you are in downtown San Francisco. In our travels to meet LightWave artists and gamers, we dropped into this new four-story Sony entertainment center. Next to the fifteen screen theatre (with the largest IMAX in North America) sits the PlayStation store. Inside the bustling bastion of buttons, customers were hypnotized by Bill's competition.

What fascinated us and forebodes well for the industry was the egalitarian nature of the electronic sports. Gals were fragging dragons, guys were First Person Shooting pastel balloons, dads played ducky races with daughters, and moms mauled monsters with sons. Everybody consumed everything.

### Game Point: LightWave 6.5 to 0

Not to date ourselves, but let's just say that one of us misspent our youth honing our psychomotor skills hunched over Midway pinball machines at the local bowling alley. So when we thought about organizing an issue on games, we figured we better tap the younger generation who were weaned on Segas and Nintendos. We found one expert in our backyard, NewTek's Philip Nelson, a console player extraordinaire. He shares his list of favorite games - using LightWave, natch. (For comparison, check out more mouse madness on the website, with authoritative reviews by hands-on experts, David Tracy and Robert Baldwin.)

After winning a game or two, read the White Paper by Namco's Michael Hulme on how LightWave 6.5 beats the competition for games development. And then peer into the fascinating world of game artists as they describe the trials and triumphs of creating award winning games like *Deus Ex*. And thanks again to Matt McDonald at Vision Scape Imaging for the cover image, Flame, a sample of future hi res games characters.

### "Open the pod bay doors, HAL."

For a historical context on this adolescent industry, Tim Jenison and Bohu Blahut revisit the olden days when video arcade games had tiny screens and Atari was king. They remind us that we have journeyed a long way from that low, low res realm of trailblazing games like *Space Colony*. And even though we have not realized Kubrick's big screen dream of rotating space stations, our small screen games are hurtling towards that future. If Tim's predictions are accurate, in the blink of an eye, high-speed polygon rendering will hoodwink our retinas and bamboozle our brains.

Oh, Brave New World,

## NewTekNIQUES

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# NewTechniques online

More Top Ten Lists of Games - Read here about Philip Nelson's fave games and then go online to check out the opinions of Game Guru, Robert Baldwin, and Game Fanatic, David Tracy.

## TEKTICKER Keeps on Ticking

[www.newtechniques.com/TekTicker](http://www.newtechniques.com/TekTicker)

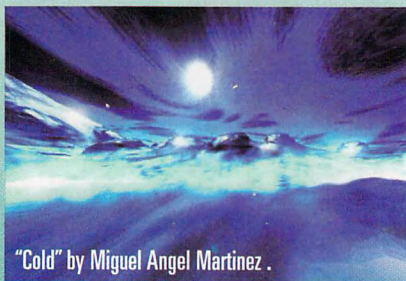
The popular TekTicker keeps rolling with news items and links about a wide range of topics. Now written by Jim Cullers, read TekTicker daily.



## NEW ART GALLERY

[www.newtechniques.com/ArtGallery/](http://www.newtechniques.com/ArtGallery/)

The NewTechniques Art Gallery continues to expand with submissions from artists from Turkey to Tennessee, Madrid to Malawi.



"Cold" by Miguel Angel Martinez .

## COLUMNS

### LightWave Fundamentals:

"Nice Threads!" - Jared Brookes doesn't screw around as he shows us how to lathe threads.



**The Idea Factory:** Bob Ketchum always amazes and amuses with his tips for the independent videographer.

**Aura Essentials:** "Starry, Starry Nights..." - In Part 1 of this issue's tutorial, Steve Bowie creates an oversize starry backdrop.

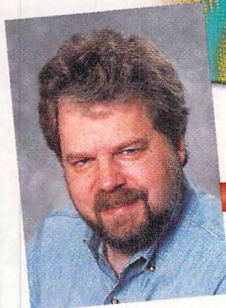
**Hear Ye! Hear Ye!** - Bob Ketchum, the Highness of High Fidelity, shows us how to elevate our audio to the upper class.

[newtechniques.com](http://newtechniques.com)



# Visions

FROM THE PAST, FOR THE PRESENT, AND INTO THE FUTURE



## GOOD GOLLY, MISS POLY

by **Tim Jenison** || **There's a Whole Lot of Renderin' Going On**

In my top-secret laboratory, one of my favorite technological relics is sequestered - the first coin-operated video game. No, not Atari's "Pong," but "Computer Space," made by a long-gone company called Nutting. Open the back of its sleek yellow fiberglass shell and amazingly you will discover VACUUM TUBES!

Yup, the monitor in this baby dates back to pre-transistor. I think the display res numbers about 160 by 100 PIXELS. And yes, it still works. But "Computer Space" doesn't thrill me like when I first played it at Dugan's Deli in Ames, Iowa in 1973.

Nowadays, games are all about polygons. The more polygons you can render in real time, the more lifelike your game. Graphics pioneer Alvy Ray Smith reportedly remarked, "Reality is 80 million polygons per second." Actually, I think he denied ever saying it; and, anyway, I believe he miscalculated. "Reality" must tally far more than 80 million polygons per second.

Whether 80 or 580, game platforms today are crunching ever-increasing amounts of polygons. And we can expect this trend to accelerate until polygon rendering speeds will be fast enough to fool the human eye.

In part, polygons are responsible for LightWave 3D's growing popularity with game designers. Unlike most other packages, our modeler lives and breathes polygons, lots of them.

One of our customers recently called me with

a rendering problem in LightWave [6]. We couldn't diagnose the difficulty over the phone so he sent one of his rogue scenes to our crack programmers for testing. I called Allen Hastings after he received the scene to see if he had unraveled the riddle. Allen said something like, "My GOD, this scene's got billions of polygons in it!" He and Stuart Ferguson quickly solved the problem and satisfied the customer. Out of curiosity, I called our client - whose work, by the way, blows my mind - and asked why their scenes were so complex.

"You know," I said, "you could simplify some of these objects if they aren't close to the camera."

"Yeah I know," he replied, "but we want the freedom to go anywhere in this little world and look close-up at anything without it looking like a cardboard cutout. I'm glad LightWave can do that!"

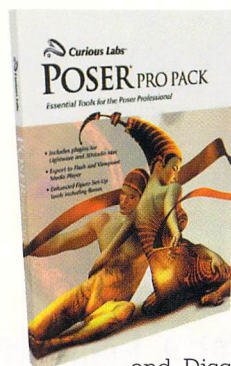
Maybe we should coin a new tag line: Billions and billions of polygons served.

What can game fanatics expect by 2021? Snow Crash? A holodeck? The Matrix? Will games be more addicting than crack? Will players forget to eat or sleep?

"I just want to say one word to you... just one word." *Polygons!*

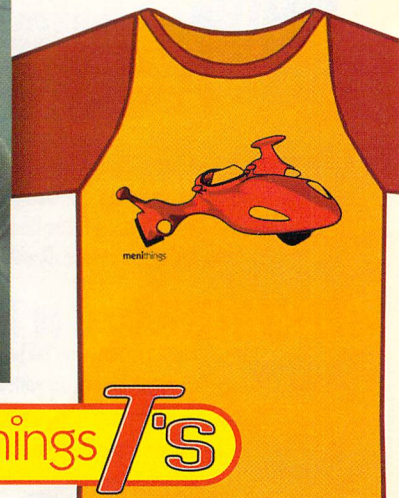
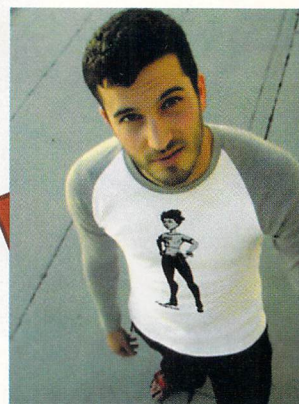


# New & Retooled



## Poser Pro Pack

**Curious Labs** has now developed an essential extension to Poser, the **Poser Pro Pack**. With the **Pro Pack** installed, users will be able to host complete Poser 4 scene files including animated 3D characters via the plug-ins included for NewTek's LightWave and Discreet's 3D Studio MAX. Animated character content created in Poser can be exported to the Viewpoint Media Player and Macromedia FLASH. **Pro Pack** is \$149 and \$219 for Poser. [www.curiouslabs.com](http://www.curiouslabs.com).



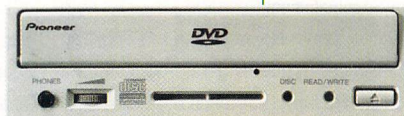
menithings T's

## MeniThings T's

Inspired by the popularity of the "Ray Trace" T-shirt at SIGGRAPH 2000, **MeniThings** has launched a line of T-shirts. The first run will feature LightWave generated imagery from the hugely popular LightWave short film *Ray Trace in Full Tilt* directed by Aristomenis Tsirbas. MeniThings paid close attention to workmanship, fabric, color, and most importantly, sassiness. More shirts will follow, featuring characters and props from MeniThings projects. The designer grade T's are available through Golf Punk retail outlets and the Menithings site: [www.menithings.com](http://www.menithings.com).

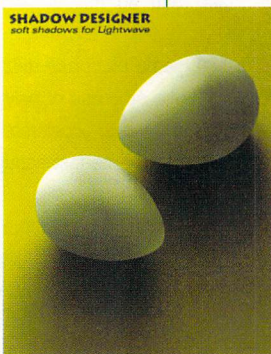
## Pioneer DVR-103 Drive

**Pioneer's** new DVD-R technology allows computer users to make DVD Video discs from their own content that can be played in most existing DVD Video players and DVD-ROM drives. The **DVR-103** drive reads and writes several CD and DVD recordable formats including CD-R, CD-RW and DVD-R which offers up to 4.7GB of storage capacity on a single sided DVD disc. Pioneer believes DVD-R media will be cheaper than any rewriteable format and the shelf life of its DVD-R media is more than 100 years. The **DVR-103** drive will be available for all PC and Mac users for \$995.



## Shadow Designer v1.0

**Shadow Designer** works as a plugin for Intel LightWave 6.0 and 6.5, simulating soft shadows from user-defined light sources. It traces a shadowmap, convolutes it, and finally applies it to the image. By modifying different settings like convolution size, distance falloff, and number of light sources, you can easily create any kind of shadow. **Shadow Designer** consists of 3 plugins - a shader through which the shadowmap is traced, pixelfilter and imagefilter that apply the convolution to the shadowmap. The plugin costs \$69. [www.evasion-studio.com](http://www.evasion-studio.com).



## NewTek's AVI Wrapper and MultiToast

The Video Toaster Universe has just expanded. **NewTek** has two new tools to enhance productivity. You can now load uncompressed Toaster clips from one of the cleanest capture cards on the market directly into MediaCleaner, AfterEffects or any Windows application with the new **AVI Wrapper** codec. Also new is the **MultiToast** Speed Razor plugin that allows you to import AVI, QuickTime and MPEG file formats into your edit timeline. DV files digitized in the AVI format are fully supported. You can import MPEG1s, MPEG2s and QuickTime 3.0 into your SpeedRazor timeline. **MultiToast** also supports almost all audio file formats. With these two codecs the Video Toaster now has comprehensive support for major file formats and applications. The codecs are free for downloading from [www.newtek.com](http://www.newtek.com).



# Why Wait?



Some things are meant for each other. LightWave [6.5] and Apple's incredibly powerful G4 workstations are a perfect example. LightWave's multi-threaded code takes full advantage of Apple's G4 dual-processor workstations, and LightWave [6.5] also provides unprecedented Open GL support for lightning fast performance. As if this wasn't enough, LightWave [6.5] has optimization for the Velocity Engine. LightWave [6.5] is available now for Mac OS 9 and Mac OS X Public Beta. Anyone running LightWave [6] for Macintosh can download the preview release of LightWave for Mac OS X Public Beta today, and will be able to download the final release of LightWave [6.5] for Mac OS X once it is available - free of charge!

What are you waiting for? Contact NewTek at 1-800-TOASTER to locate the nearest NewTek authorized reseller or visit [www.lightwave6.com](http://www.lightwave6.com) to learn more about LightWave [6.5] for the Macintosh.

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# LightWave 6.5



## PLAYING TO WIN

### For all the fantasy and fisticuffs

BY Dick De Jong & Molly



emanating from their progeny, game artists turn out to be surprisingly down to earth, nuts-and-bolts kind of guys. Probably comes from the constant concern about refueling their game engines.

"Artists create the points, the polygons, the UV's - that's just the basics of the model," Mike Sherak, Art Director at Interplay Entertainment, explains the process of converting models and animations to finger twitching action on the screen. "Other things have to be tied into the model when we export - mathematical things like stripping - so the model will be drawn properly. Then the programmers take the raw data that we give them and they munge (sic) it into their own format for the 3D engine."

Nursing a game to maturity often entails two to three year development times and teams up to 40 artists and programmers. And if you score a hit, then you can face the unenviable task of porting your baby to another platform.

"We're taking *Giants* (Citizen Kabuto) to PlayStation 2," says Sherak. "One of the difficult things in doing a port - on a console, you only have the controller; on the PC, you have the keyboard and the mouse or whatever other type of device you want to plug in. So we have to redesign how stuff gets mapped to a controller."

"The artwork has to be completely redone because the PlayStation can pump a lot of polygons but it doesn't have a lot of texture memory compared to a PC. So we have to find ways to increase the geometry and make the textures look decent or better than on a PC."

For Sherak, achieving that look means checking and retexturing 2000 objects. Even though the originals were modeled in 3ds max, he has enlisted LightWave 6.5 for the task.

### Listening to the Players

LightWave has been employed in game development for years.

"When I first started at Interplay in 1993," Sherak says, "I did *StarFleet Academy*. I was using LightWave 3.5 on the Amiga!"

"We did *Xena* (the game) at Universal Studios. It was 100% LightWave, in and out," says Michael Hulme, now an Art Director at Namco, where he just delivered *Ms. Pac-Man* (Maze Madness) for PlayStation 2. "LightWave was 90% of the package on that one."

But while LightWave was gaining prominence on TV and movie screens, the development of the tools specifically needed by game artists was being ignored. Until recently, the most visible impact of LightWave in games has occurred in producing cinematics (the high-resolution animations that often introduce a scene or greet a winner).

"We told NewTek that gaming was a gold mine," Hulme says.



Last year, they finally listened. Describes Sherak, "We actually had programmers come down here and say 'What do you guys want? We really haven't paid attention to the games side of things. Show us.' After a tour, they said 'Wow, this is more involved than doing a film.' It is."

"To actually see 6.5 come out and have the features - even better," Hulme emoted. "I would talk to Gregory (Duquesne) about the vertex coloring. He would get an idea of what we needed and then go with it and come

mutilation, they then were forced to paint their environments with tiny texture swatches.

"That's the bad part about games. A lot of artists don't even like to get into games because they want to do stuff that's high res," admits Sergio Rosas, in a round-the-workstation exchange with fellow Ion Storm artists, Hugh Suh and Robert Kovach.

"Game art is definitely a challenge to try to make something look as good as you can with these limitations," acknowledged Kovach.

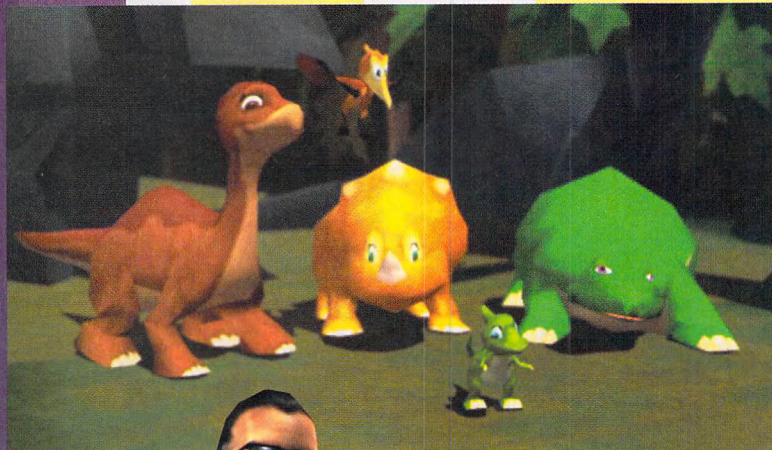
After years of wringing the maximum from your resources, one tends to be philosophical. "That's one good thing about games," Suh adds, "it's tough to produce something if you have no boundaries, tough to finish something if you have no parameters."

"I think a lot of the best art, best design, comes out of tight constraints," injects Kovach. "You learn to get creative with it. *Deus Ex* (Ion Storm's award winning homage to the conspirator in all of us) is not going to win any beauty pageants, because it's very limited."

In the future, Rosas predicts that most of the limitations will evaporate. "I had to choose between working in games or movies." Rosas concludes, "It was tough; but after seeing the next generation of games (behind closed doors), I thought, that's where I want to be."

The game playing audience will be ready because they are developing at the same break neck speed. "The general market philosophy is that children play with the sophistication of twenty year olds," says Barb Downey, the *Land Before Time* producer at Vision Scape Imaging. "An edict of Sony is that games should have this level of complexity."

For years, Matt McDonald, the president of Vision Scape, has been creating incredible models and stun-



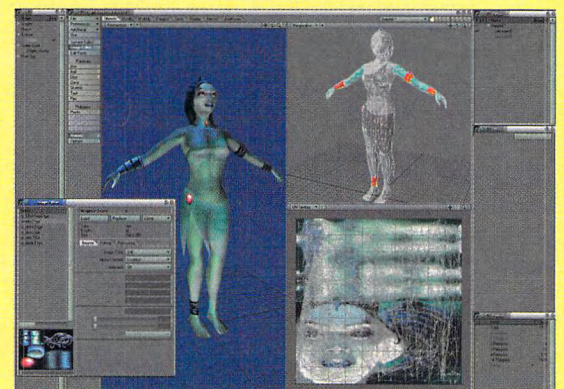
back and say 'What about this?' And we thought 'Whoa, man, that's great. I didn't know you could do that.' It really blows people away when we show them what we can do. We said that no one has really written a perfect UV tool. And they did. We're way more productive now." (For more information on UV mapping, read Robert Kovach's tutorial.)

"In LightWave, we can actually edit the model and edit the UV's at the same time and in real time," Sherak says. "That type of feedback is really important." Especially when you are revamping and retexturing 2000 objects in less than six months.

Game designers are still waiting for a non-linear animation plugin for 6.5. Sherak explains. "We want the ability of copying moves from one character to 70 others and then tweak the other 70 based on their character."

## For the Love of the Game

In the past, because of the anemic graphic processing power of computers and consoles, very talented artists stoically suffered the thankless task of reducing their finely crafted models to crude caricatures. To add insult to the



ning cinematics for games like *EverQuest* and *Twisted Metal III & IV*. With three games in development (including a top secret Xbox project), McDonald has his pulse on the gaming demographic.

"What do they want? They want violence, destruction, explosions and beautiful women. So I have developed *Hot Ass Hootchie Mommas Packing Major Firepower Appetite for Action*." Maybe the gaming world isn't spinning that fast after all.



# LightWave GAMES

## YOU HAVE TO PLAY



BY PHILIP NELSON

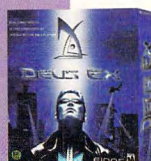
Hello, my name is Philip and I'm an incurable video game junkie.

My condition is shared by so many Americans that we're scaring the film and TV industries. That, however, is old news, but you might be surprised to discover just how many games use LightWave 3D in their production pipeline.

So for game addicts and LightWave fanatics, I recommend my personal favorites and describe how LightWave was used in their development.

For new gamers confused by all the game acronyms, the following cheat sheet should make you fluent on the arcane arcade lingo.

**FPS** \_ First Person Shooter  
**FRAG** \_ Kill  
**GOTY** \_ Game of the Year  
**LW** \_ Latest Wonder for games: 6.5  
**MUD** \_ Multi-User Dungeon  
**RPG** \_ Role Playing Game  
**RTS** \_ Real Time Simulation  
**Sim** \_ Simulator



### **Deus Ex** by Ion Storm, Austin, TX

Trust no one. Combines the FPS with an RPG to produce this most habit-forming game. GOTY 2000.

LW: All game models and animation.



### **Rollercoaster Tycoon** by MicroProse, Alameda, CA

Build it and they will come (hopefully). Create your dream theme park from scratch and try to keep the customers coming back. Highly addictive and educational.

LW: Game models



### **Resident Evil: Code Veronica** by Capcom, Japan

This game series launched a new genre - horror games. The latest release will not disappoint long time fans. Don't play this game when home alone in the dark. (Ok, maybe I'm a wuss.)

LW: Cinematics and game models





**KISS Psycho Circus: The Nightmare Child** by Third Law Interactive, Dallas, TX

The best license game to date. Anything with the KISS name would have sold, but this top notch FPS has many cool weapons and villains.

LW: All game models and animation



**Quake III Arena** by Id, Mesquite, TX

From the father of the FPS, this game is great for an adrenaline overload. Outstanding graphics without sacrificing speed.

LW: Game models



**Klingon Academy/Starfleet Academy** by Interplay, Irvine, CA

Take the helm of your favorite Star Trek ship and boldly go where no man has gone before.

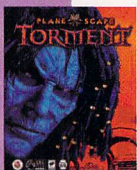
LW: All game models and animation



**Fallout 1 & 2** by Interplay, Irvine, CA

In a post-nuclear war, you emerge from a vault.. To save your colony, you must find a replacement for a broken water chip. As the oldest game on my list, The Fallout series of RPG's is a must have!!

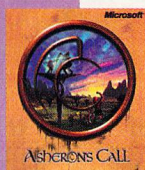
LW: Cinematics, tiles, inventory objects, and characters



**Planescape: Torment** by Black Isle Studios, Interplay, Irvine, CA

Waking up in a strange room after being killed, you must find your killer and your identity. Much easier to play than most RPG's. Good graphics and story.

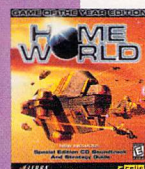
LW: All models and animation



**Asheron's Call** by Turbine Entertainment, Westwood, MA

This modern day MUD is a HUGE game that satisfies both new and old school gamers.

LW: All models and animation



**Homeworld** by Relic, Vancouver, BC, Canada

GOTY 1999. One of the more popular RTS games in the recent past, Relic's unique story raises this genre to the next level.

LW: All models and animation.

And now for something completely different, a few fine, fun family games.

**Virtual Pool 1, 2 & 3** by Interplay, Irvine, CA

Cue up the kids for 3D pool. Hand me the chalk.

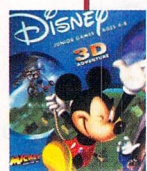
LW: Models



**Barbie Pet Rescue** by Human Code/Sapient, Austin, TX

Become America's favorite pin-up doll and search, rescue, and care for lost animals.

LW: Models



**Disney's Mickey Saves the Day** by Human Code/Sapient, Austin, TX

Help Mickey Mouse save Minnie from Evil Pete. This fun game also teaches children cooperation and teamwork! (Donetta, this one's for you!!)

LW: 3D environments



**Ms. Pac-Man Maze Madness** by Namco

Updated with 3D graphics and entertaining puzzles, this modern Ms. is the game for Pac-Man fans. Perfect for the family.

LW: Models and environments

**Red Beard's Pirate's Quest** by Human Code/Sapient, Austin, TX

The coolest children's game I've seen. Use the included toy pirate ship to attack sea serpents. Steer your boat to this award-winning toy.

LW: Models and cinematics

This playbill is only a partial list from my personal collection. MANY other great games were created with LightWave. If you are a developer using LightWave, I would like to hear from you.

Philip Nelson, NewTek's East Coast Sales Manager, can frequently be found reading Flaming Carrot comic books and playing with his action figures. Email him at [pnelson@newtek.com](mailto:pnelson@newtek.com).



# Tutorial

A STEP-BY-STEP GUIDE TO CREATING MORE PROFESSIONAL PRODUCTIONS

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# UV Mapping in THE A, B, C'S OF UV'S LightWave 6.5

by Rob Kovach

**U**V mapping is one of the most important tools for creating high quality art for computer/video games. Typically, character and object models for 3D games are composed of much lower polygonal detail than models created for the television and film industries. To achieve the best results, game artists need to rely on textures maps (called "skins" in the game world) and the efficient application of that texture to the models. The best way to do this is to use UV mapping coordinates.

UV mapping provides a very precise way to map complex objects that would be difficult to accomplish with planar, cylindrical, spherical or cubic mapping. A 2D space is created separate from the X, Y and Z world. The axes in this world are named the U and the V. At its essence, UV mapping gives you control over how each polygon is mapped. All this control at first can be daunting, especially for a model with hundreds or thousands of polygons. But thankfully, LightWave's UV tools make editing UV's just as easy as creating the models themselves.

UV maps in LightWave are called Vertex Maps or VMaps. (A vertex is the point at which the sides of a polygon intersect.) Endomorphs, Weight Maps and Subpatch Weight are also Vertex Maps. Essentially, with a Vertex Map, you can store additional information for

each vertex, which can be used for very powerful effects.

## Creating UV's

Before we create UV's, we need an object to map. For now, make a simple cube in Modeler. Next, either press the New UV Map button or go to the bottom right corner of Modeler, click on the [T] button and then from the pull down menu select [new]. In the Create UV Texture Map dialog, type in a name for your UV, (MyUV), and change the Map Type to Atlas. To see your UV, switch one of your viewports to UV Texture mode.

Let's put a texture on your newly mapped cube. Load an image with the Image Editor and assign the image and your UV to the surface used by the box.

Open the Surface Editor and click on the [T] button next to Color field.

Change the Projection to UV. A new pull down menu will popup called UVMap. Change the UVMap to "MyUV" and choose the image to be mapped. Now, click on Use Texture and change one of your viewports to the Texture render mode. You should see a nicely textured box like in Figure 1.

You also can automatically generate UV coordinates when you create primitive objects. Under the Numeric panel for most primitives is a little option at the bottom called Make UV's, which is usually inactive. To activate it, first make a Texture VMap. Before making the primitive, open up the Numeric Panel and check the Make UV's option. Make sure your new Texture VMap is selected at the bottom right corner of the screen and then drag out a primitive.

## Modifying UV's

Creating UV's is the easy part, but most of the time UV's need quite a bit of modification to use them efficiently. Before we start moving around the UV coordinates, it's important to understand how UV's work.

Basically, each vertex only gets one set of UV coordinates. This makes it very hard to map something that is entirely solid, like a cylinder, because one polygon, called the seam polygon,



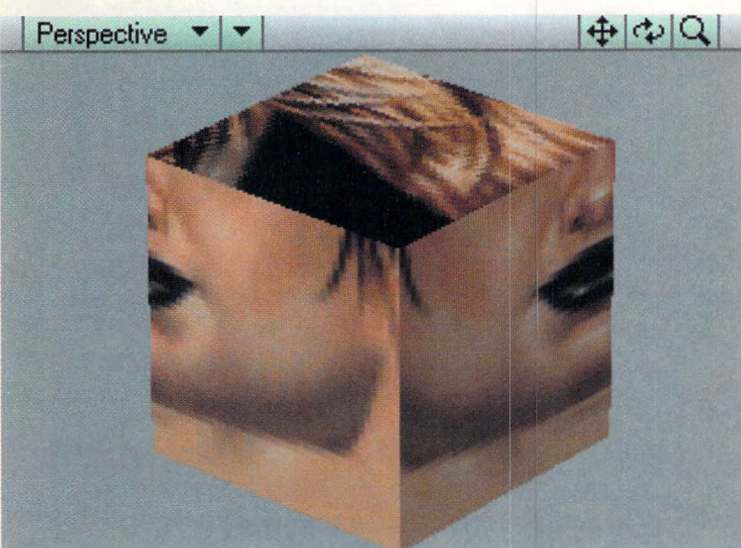


Figure 1 change as you

Let's go back to our cube and Unweld the vertices. Now we can start moving the UV coordinates around. Make sure your Perspective viewport is set to Texture render mode, and watch the texture

change as you move around the vertices. Most of the basic editing commands available for modeling (Scale, Rotate and Drag) are also available for editing UV's. A new, very useful tool called Snap will let you quickly snap two vertices together. To make more precise modifications, use the Transform UV's tool. Here you can numerically set a variety of parameters, even flip your UV's by entering a negative percent into the Scale fields. Adding additional polygons and vertices to an existing UV VMap is easy, but a little obscure. Select the polygons or vertices you would like to add and bring

tices from a UV Vmap, simply click on the [Clear Map] button to remove the selected polygons or vertices. But be careful! Clearing a polygon from a VMap clears its vertices as well, so any other polygons sharing those vertices will also be cleared! On the other hand, if your model is Unwelded, you will be able to Clear individual polygons from a UV VMap because each polygon has its own points. Therefore, none of the polygon's neighbors will be Cleared.

Sometimes you may notice an unwanted polygon appearing in your

UV VMap when you merge

points. If all the points of a polygon exist within a UV VMap, then the polygon will automatically be in the UV VMap. This situation

becomes a nuisance

later during some of

the advanced

techniques

involving multi-

ple UV VMaps.

## Using UV's

Plan before

beginning any

UV mapping.

You should know

ahead of time

how many tex-

tures you will be

using, the resolu-

tion of the tex-

tures, etc. For

instance, a com-

monly used prac-

tice in the game

industry is to split

up the textures into

groups so that tex-

tures can be mixed

and matched to cre-

ate multiple char-

acters from the same

model. In this case,

you need multiple

UV VMaps.

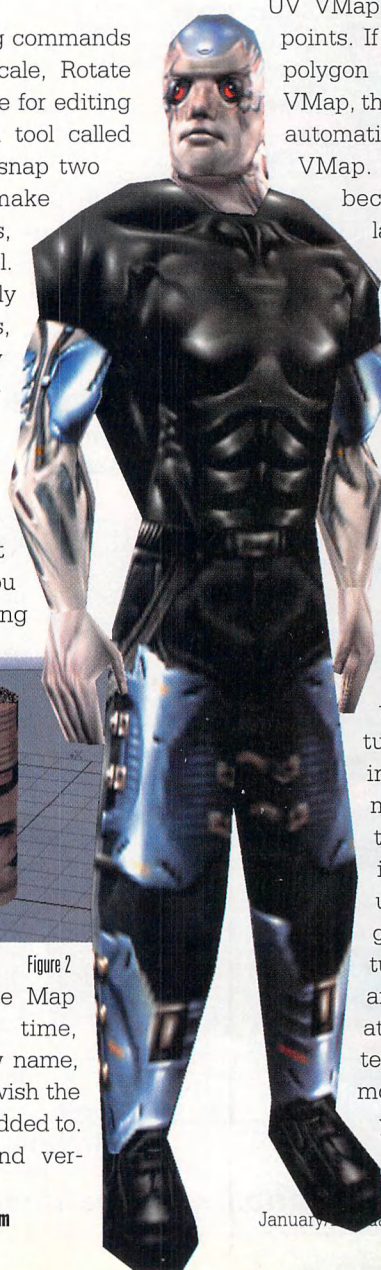
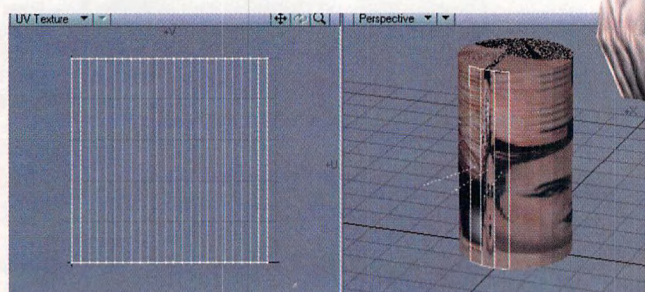


Figure 2

will get stretched across the UV space because its vertices are being shared by its neighbors who reside on opposite ends of the UV space. (Figure 2)

As you can see, one unlucky polygon gets stretched all the way across the UV space because of its neighbors. If you look closely, you can see the entire texture squeezed onto that one polygon. Luckily, you won't ever have to worry about the dreaded seam polygon because of Discontinuous UV's. Discontinuous UV's allow a single vertex to exist in UV space more than once, thus allowing the unlucky polygon at the seam to occupy its own space. This is why you should Unweld all the vertices in your model before you begin moving around UV coordinates.

The UV Texture viewport doesn't display all your vertices. The missing vertices are actually additional UV coordinates for already existing vertices. Since LightWave can only let you edit one UV coordinate per vertex, to edit those vertices, you should Unweld your model, thereby creating a vertex for each UV coordinate. You can always merge your model back together when you are finished.



move around the vertices.

Most of the basic editing commands available for modeling (Scale, Rotate and Drag) are also available for editing UV's. A new, very useful tool called Snap will let you quickly snap two vertices together. To make more precise modifications, use the Transform UV's tool. Here you can numerically set a variety of parameters, even flip your UV's by entering a negative percent into the Scale fields.

Adding additional polygons and vertices to an existing UV VMap is easy, but a little obscure. Select the polygons or vertices you would like to add and bring

up the Create UV Texture Map dialog box again. This time, instead of typing in a new name, choose the UV VMap you wish the polygons or vertices to be added to.

To remove polygons and ver-



# Tutorial

When working with multiple UV VMaps, it's essential to understand the relationship between VMaps and surfaces. While it is possible to have one surface spread out over multiple VMaps, the OpenGL display in Modeler will only display the polygons of one VMap. The other polygons will not display at all. As a good rule of thumb, make a surface for every UV VMap you create.

When UV mapping an object, you can either create your texture maps first and fit the UV coordinates around the texture, or you can create your UV coordinates first and paint around them. For work on characters, I prefer the second approach, since this allows me to place the UV's in such a way as to use as much of the texture as possible. For simple objects, it's generally easier to take a simple texture and fit the UV's around the image. Ultimately,

it boils down to personal preference.

On models that are symmetrical, I only UV map one half of the object and then mirror it. This trick makes mapping things like arms, legs and hands easy and saves a lot of time. Once the UV mapping is complete, you can simply select the polygons of the new half and, if necessary, move the UV's for the new half elsewhere.

Moving UV coordinates from one VMap to another is extremely useful for maximizing texture usage. You can move an entire VMap to another or just parts. To move UV's from one VMap to another, select the UV's you'd like to move and click on the Copy Map function. Type in the name of the VMap you'd like to move to and clear the UV's from the original VMap. Note: make sure you have Unwelded your model at least once before moving UV's between VMaps.

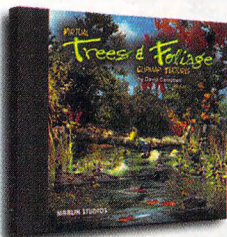
You can continue modeling after you have assigned UV's. Certain tools, like bevel or extrude, automatically create UV coordinates for the new polygons created. You can even merge polygons back to together without losing any UV information. However, polygon reduction tools like qemLoss will destroy your UV's. Subdivide and MetaNURBs both retain UV information, which is incredibly useful for modeling high poly organic objects.

*(Editors' note: Because of space considerations, Kovach continues his discussion on UV's on the NewTechniques website. You can find his "UV Mapping a Hand" tutorial in the Bonus section at [www.newtechniques.com](http://www.newtechniques.com).)*

Robert Kovach is an artist at ION Storm in Austin, Texas. He is now working on Thief 3 after completing the award winning, "Deus Ex". Email him at [robk@ionstorm.com](mailto:robk@ionstorm.com).



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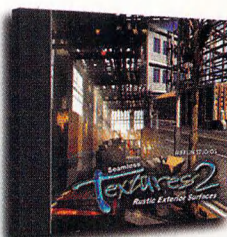
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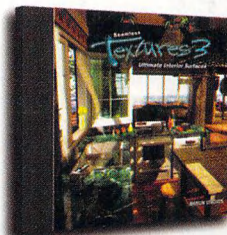
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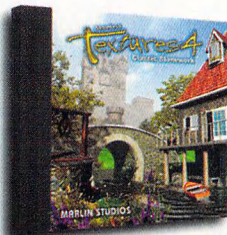
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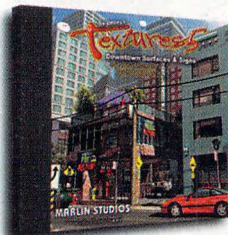
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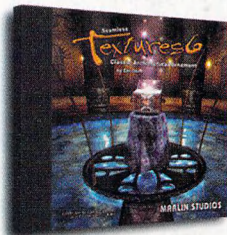
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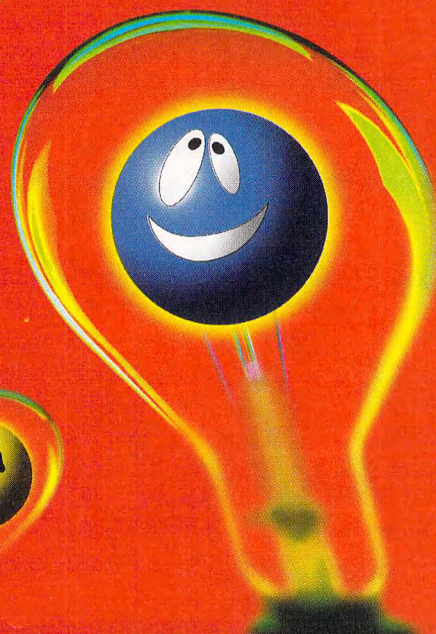
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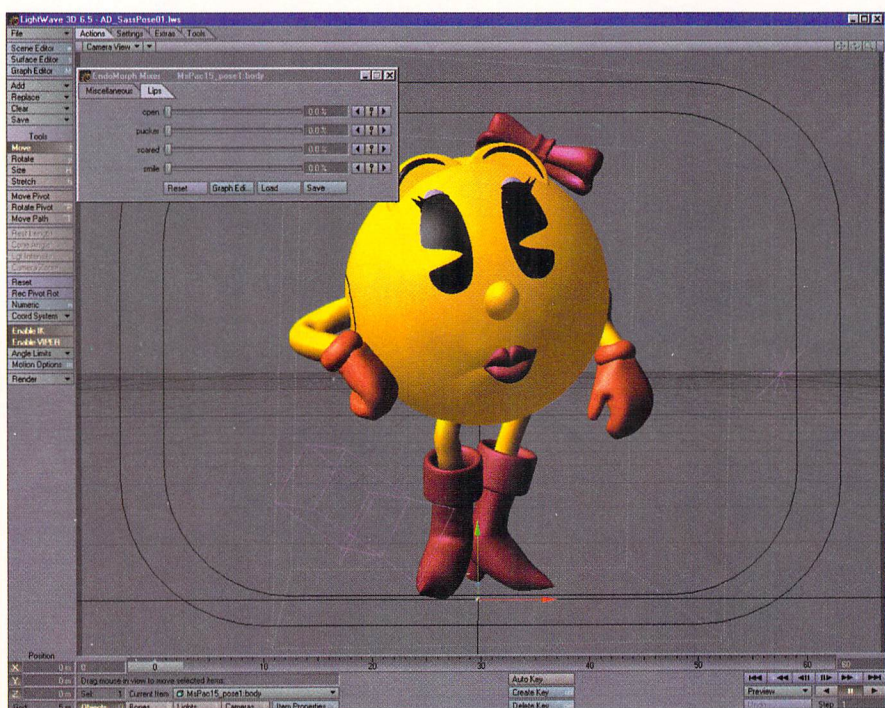
Web #104



# LightWave 6.5

## for Games Development

## A White Paper



The games market ranks as the most profitable segment of the entertainment industry. Not surprisingly, recently, all the major 3D software companies have been buzzing around the honey. Because of the constant dizzying cycle of upgrades of tools for content creation, many game developers cannot keep informed about the differences between 3D applications.

When I worked at Electronic Arts and Universal Studios, I was asked to evaluate 3D software and write a report on what's the best bang for the buck. LightWave always rose to the top. With the advent of LightWave 6.5, NewTek maintains its status.

I will present a case for why LightWave excels as a package for making entertaining, challenging, and good

looking games. In a nutshell, the software speeds up production, slows down costs, simplifies parsing, increases control, offers immediate feedback, and is easier to understand, learn, and use.

### Modeling

LightWave's polygonal modeler stands out as a crucial component for games development! Apps like Maya and Softimage work in nurbs and are not natively polygonal. Conversion to a polygonal state becomes purely guesswork. Solid modelers like 3ds max and Nichiman have to either be converted or require more polygons to maintain the model's solidity. You are at the mercy of converters and cleanup tools, and they're NEVER perfect. LightWave allows direct manipulation during the

creation and cleanup of points and polys without requiring conversion.

Game engines can read everything that LightWave puts out. With no solid model limitations, artists can save space and RAM by employing tricks like building only what the player sees (as in a movie facade).

LightWave supports N-Sided polygons. 3ds max is only a triangular format, twice as many polys as quads, and denser, cluttered objects. Granted, right now, games engines will convert to triangles as their last step in the engine; but future systems WILL support N-Sides, certainly before nurbs.

For artists who prefer nurbs modeling instead of polygonal, LightWave offers this feature at the click of the TAB key. The subdivision surface modeling has the look and feel of a nurbs-based modeling package. But, even more importantly for games production, you're modifying a polygonal object. You enjoy the best of both worlds.

The layer system rates by far the most efficient system for content creation. You can place items in a background layer to use as a template, keeping them separate and protected from modifications. Layers assist in organizing a hierarchical structure while keeping a clean, uncluttered working environment.

### UV Mapping

Most systems restrict you to either



Continuous or Discontinuous UV Mapping. With LightWave, you can choose the best method depending on the situation and complexity of the model. You have full control over perfect mapping. And you can move seamlessly between the two states at will, with absolutely NO LOSS of UV information. Moreover, you may export and import data to or from other systems in either method.

The Mapping Editor is integrated into the modeling environment so the artist can see, select, and map various hard-to-get polys in any of Modeler's windows. Orthogonal, perspective and UV Editing viewpoints can all be visible for real-time feedback. Most UV Editors allow a background image for the proper placement of UV's on a map, but often the points get lost among a busy or high-contrast image. LightWave provides the extra ability to reduce your background image's brightness or contrast.

LightWave's UV Mapping allows multiple mix and match mapping modes within the same UV Map, including assembling Planar, Cylindrical, Spherical and Atlas mapping together. Organic objects rarely conform to one mapping method. In some packages, you must choose one mode or the other, and hand-edit the UV's that didn't fit, which consumes too much time in a production environment.

Another major timesaver - especially with highly complex models - Atlas Mapping Mode allows you to unwrap your model in a way that gives you the most access to your object's surfaces. It basically forces ALL the polys in a map to face forward in your editor for extremely easy editing.

Modeler's familiar modification tools work on UV Maps in the UV Texture window, making editing maps seamless to the whole process of modeling. Scaling, moving, rotating, dragging points, etc. are the same for models and maps.

UV's remain INTACT after further modification of the model. The importance of this cannot be overstated!! No other program allows the addition (or removal) of data onto an existing UV

Mapped object without those UV's being adversely effected. Even a difficult procedure like Boolean slicing keeps the UV Map intact in LightWave.

UV's are generated by many of Modeler's complex creation tools like Lathe and Extrude. Even subdividing, or tripling the polys of a model will have those new points assigned UV's on-the-fly without so much as a hiccup to the previous map.

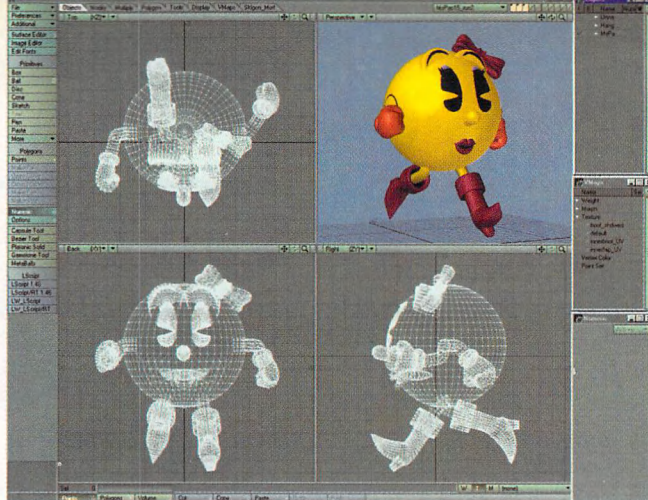
You also can UV Map ALL surface attributes, including Bump, Reflection and Clip Map! As game engines advance, they will include these extra attributes. Most other packages limit UV Mapping only to color, and maybe diffuse attributes.

## Vertex Coloring

For Vertex Coloring, you can paint with the Airbrush tool directly on an object in any of the viewports, with the application of color based on strength (percentage) for soft blending of colors. Most packages paint on a Vertex (if they even have the ability) with an ON or OFF color system.

With LightWave\_TextureVMap tool, you can use the colors of a texture map (as well as the Alpha value) to color the vertices of a model. This method offers precise positioning, as well as complex coloring schemes, which would be prohibitive to paint by hand.

Game artists have always attempted to mimic the look and feel of real-world phenomena like bounced, reflected, or refracted light; cast shadows; and organic surfacing. LightWave's mathematical rendering engine produces these elements photorealistically; but, until now, games engines could not use them. With the LightWave\_Baker tool, you can combine effects (including radiosity, caustics, surface coloring, procedurals, and gradients) and burn them into either an Image Map (to be UV mapped back onto the surface) or into a



Vertex Color Map. Both can be read easily by a games engine. Most other packages don't even render Radiosity and Caustics, much less burn them in.

In LightWave, a combination of surface attributes can co-exist on an object, such as a standard diffuse shaded surface, with some specular and reflection WITH a Vertex Color Map. Many systems regard a Vertex Color Mapped object to be self-lit (or 100% luminous), thus preventing the application of dynamic (real-time) lighting effects on these objects.

Vertex Color Maps are easily added, changed and removed from surfaces. They exist in a pulldown menu in the Surface Editor among all the other surface attributes and not in a separate panel. Since you can assign multiple Color VMaps to an object, you can animate vertex colors by switching from among the list. You can achieve a fake dynamic lighting effect without using frame-rate gobbling real-time lights.

LightWave can assign or burn-in Vertex Color Maps globally across the entire object or per-surface for very specific applications of color.

Vertex Coloring is integrated into LightWave and contains many built-in tools to create and modify the maps. Other packages offer the feature as a plug-in or as an extremely expensive addition. Even a specialized powerful vertex coloring tool like *Vertex Paint*, a 3rd party plug-in, is available FREE to LightWave owners.

## Surfacing

With LightWave's sophisticated surfacing tool, you can easily apply and manage an object's surfaces and their



# A White Paper

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attributes. It provides unlimited layering of attributes on a surface using any combination of image maps, procedural textures, gradients and shaders.

Powerful gradient parameters offer unprecedented control over surface attributes. For games, most of these advanced features would be irrelevant since they are only parameters for the renderer; but, a great majority can now be burned-in to an image or Vertex Color achieving an exact replica of the rendered surface for display on real-time engines.

Surfacing an object with hundreds of surfaces can be extremely difficult and time consuming. LightWave's VIPER window provides not only the real-time display of rendered surface attributes, but also the direct mouse selection of surfaces for editing.

## LWO

The LightWave object file, .LWO, is a compact and efficient object format (IFF Chunk). An .LWO measures half the size of the same model in .OBJ, and ten times smaller than .DXF. Though roughly the same as a .3DS, the 3ds max file doesn't include all the attributes of .LWO. And you can't write to .3DS since it's not really an object format per-se, but rather a series of commands to modifiers that act on the mesh.

The IFF format organizes data into neat chunks for easy identification of pertinent elements to the games engine. Programmers can flag areas of the object's data to ignore if they have no relevance to the engine. These chunks always will be found in the same place and order for every model.

LightWave offers many ways to tag polygons and points so you can flag elements of an object to trigger events or to remind programmers of specific functionality.

LightWave's object format contains ALL of the individual morph targets for an object in the object itself, not saved separately somewhere else. The deliv-

ery of morphing animations to a games engine often requires the delivery of a base object and all its associated morph targets, which could amount to over 100 objects. With LightWave's embedded morph targets, the smart system updates all embedded targets whenever a change is made to the base object.

The MorfMixer tool in Layout organizes all of the target data into neat, tabbed sections on an interface with sliders to blend and manipulate the targets for an unlimited range of combinations captured into keyframed data. The delivery to an engine requires only one object and one scene file.

In most programs, "weighting," in 3D terms, is limited to assigning the percentages of influence that a bone in a skeleton will have on an area of the object to which it belongs. In LightWave, weight maps are created for multiple purposes, giving the artist potent and efficient tools. Weight maps can be painted on (positive and negative values) with the airbrush tool for very subtle effects, as well as textured on using an image map's brightness values for extremely precise control.

These weights can control a bone's influence and falloff on an area of an object. They also can control an object's deformation by using procedural displacements or falloff parameters for many of Modeler's tools.

## Character Building

Unique to LightWave, a separate Modeling area allows the artist to remove items from a cluttered scene and modify them in a low overhead (fast refresh) environment. Now in 6.5, everything you need to setup a character and produce a ready-to-animate state is in Modeler including pivots, parenting, hierarchies, skeleton setup, weighting, surfacing, UV Mapping and any morph target creation.

LightWave 6.5 enhanced the speed and accuracy at which it solves IK,

(I)nverse (K)inematics. Only recently have engines been able to accept IK data. Because it's so computationally intensive, the data is usually converted to keyframes. Characters often contain a hundred or more bones or hierarchical children in an IK chain. Simply moving a goal object can cripple a sub-standard 3D package, but not in LightWave.

A robust expression engine and a full-featured scripting language known as LScript are part of the core package, and offer a huge variety of animation possibilities from automating the simplest tasks to controlling whole scenes with mathematically intensive formulas. Technically savvy artists and programmers alike can write LScripts that customize the data to fit exact specifications required by the games engine.

## We are the World

Technical information and support is widely, and freely, available to the public. The SDK, including a full description of the object format, can be downloaded from the NewTek site. Also a huge pool of freely distributable or extremely low priced plug-ins are available from software developers. Books, magazines, Internet sites and mailing lists specifically address the LightWave community. And Newtek definitely listens to the needs of their user base.

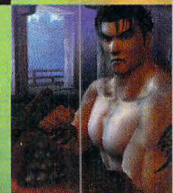
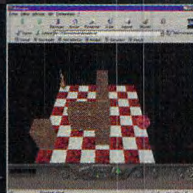
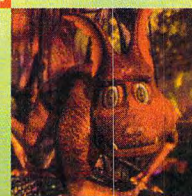
The continuity of LightWave's development team is noteworthy. The original authors - Allen Hastings on Layout, and Stuart Ferguson on Modeler - still head up the project. The maturity of these packages cannot be overstated.

LightWave already has a stronghold on the movie and television industries; and, as I have shown, it should become a major presence in the games industry, too. In the polygonal world of games production, LightWave proves the obvious choice. ■■■

Michael Hulme is an Art Director at Namco, an international entertainment company. His team recently finished the PlayStation 2 version of Ms. Pac-Man Maze Madness. Email him at [Hulme123@aol.com](mailto:Hulme123@aol.com).



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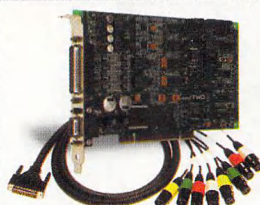
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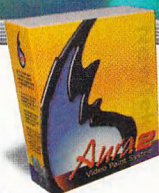


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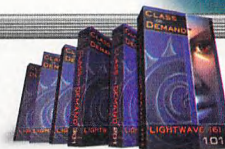
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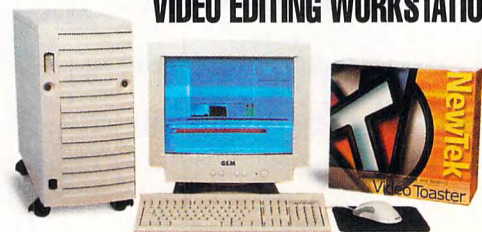
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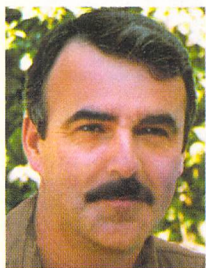


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# Aura Essentials



by Steve Bowie

## CREATING “CHAOS” And Keyframer II

**T**errence Walker has garnered well-deserved attention for his *Understanding Chaos* project (<http://chaos.indirect.com>). His ambitious “Earth vs. Mars” anime movie has been commended for both plot and style. Of course, LightWave3D gets prominent billing in this one-man effort - but Aura definitely has played sidekick! Terrence has remarked on the important role of Aura in his digital arsenal. We asked him to expand on those brief comments, and he has generously done so. Afterwards, we will explore Aura2's Keyframer.

came into the picture.

When the Amiga died, I reluctantly (and rather late compared to most) transferred to the PC. All was lost. There simply wasn't a program out there that allowed me to do what I wanted to do. Photoshop simply wasn't a paint program, never mind how unfamiliar it was to me. My computer was in no condition to dare attempt to run Fractal.

Regardless, I plodded away learning new tools and new ways of doing things, but never achieving the speed and ease of use I had become accustomed to. Animation? It was a thing of the past. At this point my focus started shifting more and more towards 3D animation and realistic rendering.

### An Interview with Terrence Walker

**AE** - Please shed a little light on your history as respects digital artwork - I gather that (like all the best people) you have an Amiga background?

**TW** - I had been drawing and painting for as long as I remember. Then came the Amiga. When I got my hands on DPaint for the first time I saw some major potential there. Ever since some of the old cartoons like *Voltron* and *Robotech* flew across American TV screens, I knew what I wanted to do. With DPaint, on that old Amiga 2000 I was finally able to start doing it.

The transition from using a pen to doing it with a mouse was a hurdle; but eventually I was creating images that, at that time, seemed ready to go into cartoons.

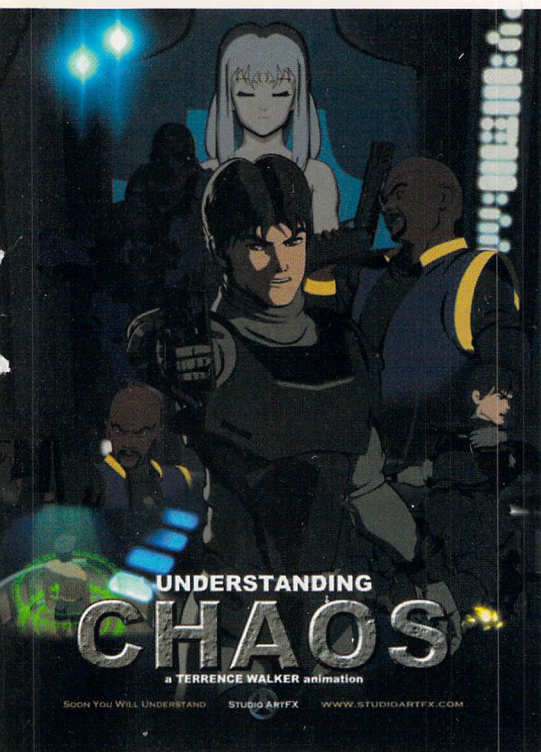
As the Amiga paint software progressed, DCTV, Brilliance and TVPaint, so did my artistic skill. I was soon able to duplicate my watercolor style for backgrounds with the improved paint tools each program offered. Also, animation

**AE** - You used Aura extensively when working on *Lands of Lore III* at Westwood Studios. Can you tell me how it was used, and why you chose it over existing tools?

**TW** - On *Lands of Lore III*, I started out doing texture work and icons. More than any other package, Aura was suited to this application. Icons for a game are tiny, requiring “dot art” to create. Aura can function like the older DPaint-style programs AND work just as well as the newer stuff (like Photoshop). It was the best of both worlds for creating high-res textures and tiny icons.

Aura's biggest application came when I started on the finale cinematic sequence (FMV). I began to explore Aura's potential as a compositing tool. Other artists recommended the more established tools they had been using, but these seemed to slow me down. They seemed to “get in my way,” rather than making the job easier! They also had no actual 2D animation tools. Aura allowed me to work in multiple layers, combining 2D and 3D to make a better final shot.





**AE** - Any Aura techniques you can share that might be of interest to others working in the game realm?

**TW** - I think people already do this; but with Aura2, I like to paint textures as much as four times the size they will appear in the game. Aura's scaling routines are very powerful. The anti-aliasing creates a final image that is smooth, yet maintains detail very well. This gives me a lot more freedom in painting the texture, yet lets me work much faster.

**AE** - LW3D was obviously a big part of Understanding Chaos. Yet, you mention substantial honors go to Aura, too. What main functions did Aura serve in this project?

**TW** - Aura is where all shots are finalized. The backgrounds are often painted in Aura and all other materials are composited using the layer functions. Any camera work you see in *Chaos* is done in 2D using Aura's Keyframer. All shots are color-corrected to be "video safe" before output.

Many shots were rendered very large compared to final (video) resolution, then manipulated using Aura's Keyframer to give the impression of a hand-held or 3D camera. There's quite a bit of 2D animation in there, too.

**AE** - Why did you choose Aura, from a field of so many other capable paint and compositing apps?

**TW** - From what I could tell, the other paint and compositing apps did only one or the other. You would need a third app to add 2D animation. I can't deal with that in a one-man production where speed is everything. Aura is easy to use, and does it all. It may not have every feature of a full-fledged compositing app; but, in those other packages, it always seems as though a bunch of stuff that I will never use is in the way of something that I use over and over. I have yet to come across a better tool for a project like this.

**AE** - Did "George" help you at all?

**TW** - The George panel is always open. I wish I had the time to truly learn it better, having experienced a bit of the power. There are a few computer screens in *Chaos* which use a modified version of the "type-on" George script. I also created a modified "zap" script for some effects.

**AE** - Did you use Aura to batch process the finished frames?

**TW** - This was one of biggest uses of Aura in *Understanding Chaos*. The color ranges were very important in showing on television. I spent a lot of time finding out what those ranges were! Then I created settings for blur, color adjustment and histogram panels to achieve those ranges. Every shot had to go through this process. The final step is an aspect ratio conversion, since I work in square pixels and video does not.

**AE** - *Chaos* exudes a nice "shadowy" environment, dark enough to be a bit foreboding, but light enough to be visible - did you do some luminance/gamma tweaking in Aura?

**TW** - One of the most important

things I found in working in DV is the black level. If black is just "RGB 0-0-0," the shot will be too dark. Also, for the sake of mood, many scenes went through a color saturation reduction, especially in the large room where the final battle takes place.

**AE** - Did you use Aura's layers to do any compositing of elements, or did you do that in LW?

**TW** - All compositing is done in Aura. Usually, basic elements are rendered in LW. A background will be clocked out for lighting and shadow, and then brought into Aura and processed or painted over. All other elements, including volumetric lights and lens flares are rendered separately and brought into Aura as layers. (Fig.1)

**AE** - You were a beta tester for Aura2 - anything in it you really love, or that will make your projects easier or faster?

**TW** - The Keyframer in Aura2 is a



Figure 1

dream! It gives me incredible "camera" abilities with a single painted image. I can take a background or even an entire scene (as an animbrush) and perform zooms, camera shakes (for "hand-held" work), or a combination of all of these. This allows me to go far beyond what is possible in traditional 2D animation filming.

When working for video - especially digital video - the color correction and balancing tools are essential. I have some easy presets that will insure that



my reds never bleed, my whites never clip, and the blacks don't go too dark.

**AE** - How do you feel about NewTek, their philosophy and products generally?

**TW** - I've been using NewTek products for nearly 10 years. When the Toaster came out, it changed lives. I was doing professional commercial work that I would have never thought possible before. This aspect of their philosophy has always attracted me. Imagine the power they gave to a lot of producers out there in the world. They continue to do that!

## Post-mortem of a Composite

Terrence was kind enough to provide

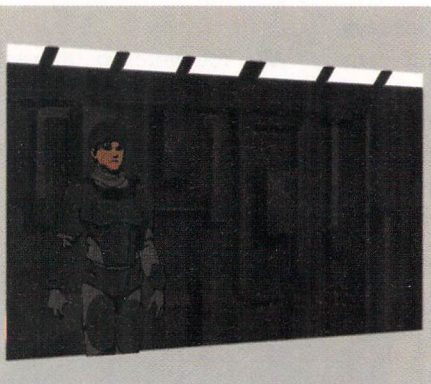


Figure 2

AE with a complete set of images comprising the elements of one particularly memorable composite scene from *Understanding Chaos*. Below, we reprint his remarks on each layer's origin and inclusion in the finished work. Considering these insights will doubtless give you a few ideas of your own, in addition to illustrating the flexibility of compositing versus the "single-pass" approach.

**Layer 0:** "Fig. 2 is the background Layer. The basic 3D shapes are rendered in LightWave3D 6.5 for proper perspective. The elements are then brought into Aura and painted on, mainly to rough up edges and eliminate the harsh CG look."

**Layer 1:** "The screen element was originally composed as another Aura project. It involves wire-frame elements rendered in LightWave, and some work in Aura using a modified George "type-on" script. It was finally rendered as an animated sequence on the screen polygon in LightWave to match the background perspective."

**Layer02:** "The 'reflection' element in Fig.3 actually exists (in LightWave 3D space) behind the wall in the background layer. It is rendered through a hole in the screen with the background wall as a 'matte object' which blocks the alpha channel. It is composited in Aura on top of the screen element at 40% opacity."

**Layer03:** "The final element is Fig.4, our main character (Han) standing in front of the screen. This is a LightWave rendered element."

**Final Comp:** "Fig.5 is the end result. Notice how the reflection of Han in the screen is very transparent.

That's the magic of Aura's opacity slider, judiciously set in each layer."

## Keyframer II-On the Aura Back Lot

In discussing his preference for Aura, Terrence mentioned his use of oversize imagery several times. With larger than necessary images, you can use Aura as a virtual camera. With the "Keyframe" Filter, you can easily reframe the shot, performing animated pans and zooms to your hearts content.

Watch *Understanding Chaos* and try to pick out the countless places where impact and interest have been added by a subtle zoom, camera move, or shake. You will realize why Terrence is so insistent on Aura's importance to the project, and just how useful this

technique can be. While the process is worth examining. The exercise below should get you started nicely.

Since many of you have upgraded to Aura version 2, from now on, AE will refer v.2. Where appropriate, we'll include helpful hints for users of v1.

Let's set the scene. Picture the

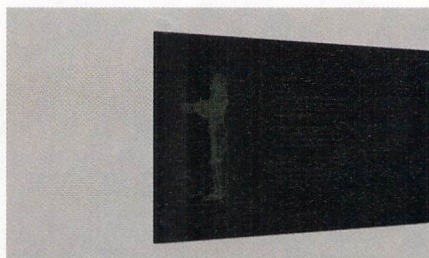


Figure 3

"God's Eye View." You are the deity, seated comfortably on the cozy swing on your front porch. You cast a weary eye out over the starry expanse, procrastinating over the need to fill in that black hole in the driveway. Just then, a Star Cruiser slides ponderously by at the edge of your field of vision. "Oh, good grief," you muse imperiously, "what are they up to now?" Then slowly, so slowly, you turn your eyes leftward and down, panning majestically across the twinkling firmament, until your gaze encompasses the little green and blue gem they call "Home."

Let's make the shot! "Piece of cake," you say. I'll just load up LightWave, a "planet" object, a copy of "random-stars.lwo," a dash of lighting and a keyframe or two, and hit F10. Sure, that would work. But consider the advantages of doing the shot as a composite in Aura instead.

First, it'll be a lot faster to render initially. Then, suppose your client says "That's super, but I want the title fixed in place, so the camera pans across it as it traverses the sky." In this case Aura lets you make the change without requiring a time consuming 3D render!

Let's assemble the components of the shot. The basic recipe really only calls for one item: an oversize shot of



the galaxy with a planet in the foreground. We could scan one out of a magazine, render a single high-res frame in LightWave, or paint it by hand in Aura. We'll combine the last two options. I've used LightWave to render a little brush of a planet and its star, which I'll place, along with other useful images, in the Aura/Downloads section of the NewTekniques website.

(Editor's note: Part I of this tutorial {creating the starry backdrop} is also in *Aura Essentials* on the website.)

Now that you have created your super-size image in Part I, here comes the fun part – using Aura as a virtual camera! We'll use the Keyframer to pan our virtual camera across it. It's almost too easy to bother describing, but I'll do so to point out a few new things in Aura2.

Open a new project at your standard video resolution (for NTSC Toaster V1 users, that would be 720 X 480, 29.97, even field first – you PAL guys 'n gals



Figure 4



Figure 5

know what to do.) Drag the endpoint of the layer to something like 240-300 frames (this is a sloooooow pan.)

Load your hi-res star field image into Aura as a brush. Open Aura's "Keyframe" Filter and, in case you've been mucking about with it, select "Reset" in its File menu. Set the filter's

"Source" mode to "Brush," and checkmark the "Preview" box at the bottom. Select the first frame on the timeline by clicking on the Layer panel drag bar to activate it, and hitting the "Home" key.

By default, the Keyframer brush preview is centered on the Project window. Drag it down and left, until you see the right and top borders of the brush appear in the upper-right corner of the screen. Naturally, you've gone just a bit too far at this point; so re-position the brush so it nicely covers the screen. If you have "Auto Key" turned on (just below the Layer panel title bar), a keyframe for the brush at this frame has just been set. Its position on the timeline is represented by the small "+" below the frame. Now move to the last frame of the animation, by pressing "End" on the keyboard.

Reposition the star field brush so that, in the last frame, the planet is tidily placed in the lower left corner of the frame. You should see a white line (representing the current Keyframer path) stretching from upper right to lower left. In this instance the lower left endpoint of that line marks the center of the brush at the first frame, while the upper-right endpoint is where the brush will be centered in the last frame.

Now, here's something cool. We don't want the camera to slam into it's ending position – we want it to "ease-out." Aura2 allows us to use splines to control Keyframer motions. Checkmark the "Spline" switch in the Keyframe panel. Since our motion in this animation is linear, the spline handles that appear in the Edit window review may be hard to see (since they line up with the path). However, if you click on the upper right end point of the path, the spline control handle will appear. I've moved the handles in Fig. 6 to show them to you more clearly.

By dragging the handle's diamond-shaped endpoints you can alter the curvature of the path. When you change the *length* of the handles, you



Figure 6



Figure 7

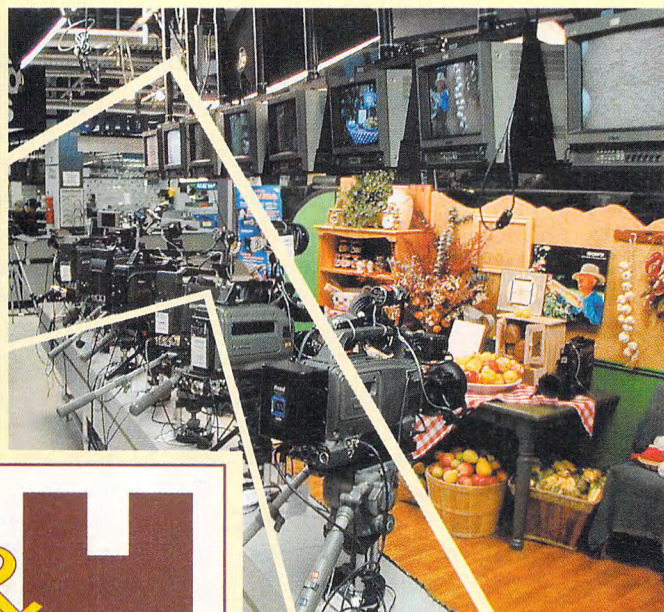
alter the ease-in/out characteristics of the move. We want to shorten the handles substantially. Drag one of the endpoints in towards the handle's center until the handle is roughly 1/3 of its original length. With that done, select the first frame of the animation, and repeat the operation. (A quick way to move to the first frame is to click on its node in the path shown in the edit window.)

Now render the animation, secure in the knowledge that a) it will not take nearly as long to render as it would in 3D, and b) if you need to make changes, it won't take long at all! Here's another tip: you can select all the frames of the current layer for which keyframes exist by hitting "Control + S" on the keyboard. By the way, you can select ALL the layer's frames (which may not be the same thing at all) by double clicking on the layer in the timeline. Do the former before you render or you'll only affect one frame.

Of course, pans, trucks and dollies, curving paths, camera-shakes, zooms, DOF and even rack-focus effects are all possible without ever leaving Aura! Again, take a slow look at *Understanding Chaos*, you'll no doubt come up with many additional ways you can take advantage of this simple but very useful facet of Aura's toolkit!

Steve Bowie, a longtime digital dabbler and enthusiastic LightWave and Aura user, also writes the Aura Essentials column at [www.newtekniques.com](http://www.newtekniques.com). He owns LIGHTWORX Graphics & Video, a NewTek authorized Toaster/LightWave dealership in Toronto. E-mail to [steve@videotoasterworx.com](mailto:steve@videotoasterworx.com), or check out his website at [www.videotoasterworx.com](http://www.videotoasterworx.com)





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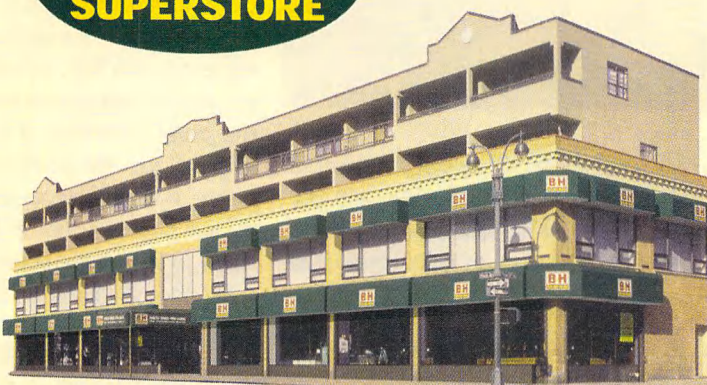
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## Panasonic

### AG-DVC10

#### Mini DV 3-CCD Camcorder

This lightweight unit uses the mini-DV format, large diameter lens, and a 3-CCD image sensor to deliver the high recording quality needed for professional use.

- Records audio either as 16-bit 2 channel, or 1 2-bit 4-channel
- Gain Up to +12dB
- Neutral Density Filter
- Manual Focus, Manual Iris
- Excellent Shooting Stability
- Light weight weighing approx. 6 lbs.
- Extremely mobile
- Superior 3-CCD Picture Quality
- 1/4 inch, 270K-pixel IT 3CCD image sensor • 43 mm filter
- 12x Optical zoom
- New Shoulder-Type Design**
- I-Link (DV IEEE1394) Terminal**



#### High-Quality DV Recording

- Records on Mini DV cassettes in either SP (standard Play) or LP (Long Play) mode

### AG-DVC200

#### Full Size DV Camcorder

*The industry's first DV camcorder to utilize large DV cassettes*



The 11-pound shoulder-style camcorder delivers many functions offered in Panasonic's most-popular DVCPROcamcorders, including a 4-position ND/CC filter, the ability to increase gain up to +36dB for shooting in dim light, User Scene Memory storage, and a 6-speed shutter with synchro scan for the flicker-free shooting of CRT displays.

The AG-DVC200 1/2" 410,000-pixel IT 3-CCD DSP camcorder records for an astounding 4-1/2 hours (270 minutes), and offers an interchangeable bayonet mount lens that permits users to use their favorite 1/2" lens. With the incredible ability to shoot at F11 in lighting as low as 0.5 lux, the AG-DVC200 delivers an outstanding 800 lines of horizontal resolution, an IEEE 1394 interface, a signal-to-noise ratio of 62dB, and very low smear.

## Canon

### XL-1 3-CCD Camcorder with Interchangeable Lens Mount

With 3-CCDs, exclusive interchangeable XL Lens Mount System, unmatched optical technology, SuperRange Image Stabilizer, DV and simultaneous four channel audio recording, the XL-1 offers unmatched image quality and shooting versatility.

#### Interchangeable XL Lens Mount System

- Interchangeable XL lenses for unsurpassed flexibility and multi-coated optics to achieve 600 lines of resolution.
- 16:1 Optical Zoom with SuperRange Image Stabilizer**
- The 16:1 has a focal length range of 5.5 to 88mm (35mm equivalent of 39 to 633mm). It offers variable speed zoom, manual zoom and manual focus control and has a one-push auto-focus button and built-in 1.5X ND filter.
- The SuperRange Optical Image Stabilizer uses a motion vector to examine the image after it is received by the CCD to detect any shake.

#### Digital Audio

- Three digital audio modes (16 bit and two 12 bit modes) and simultaneous recording of four separate tracks. You can output each signal independently.
- Audio inputs with independent level controls.

#### 3-CCDs

- Three 270,000 pixel CCDs with advanced Pixel Shift technology achieves 530 lines of resolution.

- Large 72 micron CCDs deliver a 4dB improvement in sensitivity.
- Three Recording Modes:**
- Unique Design & Dual Action Carrying Handle**
- 180,000-pixel color viewfinder
- Automatic and manual white balance, gain (five preset levels from -3 to +12dB) and exposure lock.
- Zebra pattern and color bar generator
- Composite, S-Video output, DV (IEEE 1394) in/out, Control L
- Digital fader and wide screen TV effect
- Headphone jack with level adjustment
- Remote control with jog/shuttle dial



### GL-1 The First Digital Video (DV) Camcorder with PRO L-Series Fluorite 20X Zoom Lens

Building on the company's design heritage in professional 35mm photographic and broadcast TV lenses, the GL1 is equipped with Canon's exclusive L-Series Fluorite 20X optical zoom lens and 3 CCD image sensors, offering outstanding imaging power in a lightweight, portable design. In addition, the GL1 also incorporates the world's first 20X optical zoom. With the cameras ability to extend to a 100X digital zoom, users can increase magnification too distant to be seen with the eye alone. Encompassing the design characteristics of a consumer camcorder with its compact size and 2.5" flexible LCD view screen, color viewfinder, the GL1 is also equipped with much of the same functionality that attracts newscasters and independent filmmakers. By extending broadcast-quality DV technology to consumers, Canon is bringing high-quality video production capabilities to homes and small businesses. For users interested in visual computing, this FireWire IEEE 1394 compatible camcorder is ideal for producing QuickTime movies and creating images for distribution via the Internet. FireWire is one of the fastest peripheral standards in the DV industry, offering 30 times more bandwidth than USB, allowing for high-speed desktop video editing and display.

- Professional L-Series Fluorite Lens - a material that provides outstanding resolution, contrast and color reproduction and minimizes color aberration, especially in high-magnification lenses.
- 20X Optical Zoom - At a 35mm focal length equivalent of 40 - 806mm, the 20X optical zoom transforms distant subjects into dramatic close-ups.
- 100X Digital Zoom - capable of extending between 40X - 100X. At full telephoto, the 35mm focal equivalent is 80-600mm.
- Optional WD-58 Wide-converter will increase by 0.7X, 28mm in 35mm focal equivalent, for indoor shots or panoramic views.
- Optical Image Stabilization - eliminates image shake due to a wide range of movement and/or high wind conditions.
- Three Shooting Modes - Frame Movie mode allows users to record high-speed action at 30 fps. - Normal Movie mode delivers more than 500 lines of resolution - Digital Photo mode, with self timer, captures more than 700 still frame images on a single 80-minute cassette in SP mode. For SLR-style flash photography, the digital photo mode will accommodate a selection of Canon's speedlight flashes, including the 220EX, 380EX or 550EX.
- Direction Accurate Microphone
- Programmed AE - Offers seven advanced recording controls - Full Auto Green Zone - Auto Mode - Manual Mode - Spotlight - Sand & Snow - Shutter Priority/Aperture Priority
- Picture Adjustment Supports - Camera Sharpness adjusts picture sharpness before recording.



## SONY

### DSR-PD100A

#### 3-CCD Mini DVCAM Camcorder

The smallest DVCAM camcorder, has also built-in image capture capability. The highly compact camcorder features three 1/4" 380,000 pixel CCDs that allow two scanning modes: 480 progressive (for stills) or interlaced (for video).

- The CCD's can be switched to scan in two ways: Interlace Scan for recording moving images and Progressive Scan for recording still images
- Super SteadyShot compensates for unwanted camera movement without reducing image quality
- A built-in 12X zoom lens is supplemented by a 48X digital zoom that can provide really close up shots
- Manual control of focus, gain, white balance and shutter speed. Also has full automatic control
- Records PCM digital stereo sound in both 48 kHz mode (16-bit) and 32kHz mode (12-bit). When a recording has been made in 12-bit mode, another stereo channel can be added later
- The DSR-PD100 has a 3.5" color LCD monitor with 184,000 pixels, opening 90° to the side and swiveling 180°. Also has a 180,000 pixel color viewfinder.
- Can record still images on both tape or removable media, such as Memory Stick



- Supplied XLR adaptor attaches onto the hot shoe of the camcorder, allowing external professional microphones to be connected to provide high quality audio sources. Through XLR adaptor, DC power +48V for a supplied microphone • A 0.7X wide conversion lens is supplied.

**Sony DSR-PD100A List Price .....\$2,825**  
**For B&H price .....Call**

### DSR-PD150

#### 3-CCD Mini DVCAM Camcorder

High quality acquisition in the DVCAM component digital format, as well as in DV, allowing up to forty minutes recording on one tape Mini DVCAM tape or over a full hour in DV mode. Suited for Event Videography and Video Journalist applications. This compact camcorder features three newly developed 1/3 inch 380K pixel CCDs with increased resolution and sensitivity at reduced noise and vertical smear.

- Allows two scanning modes: 480 progressive (for still) or interlaced (for video) • Complete Professional Audio functions with two built-in XLR inputs
- Built-in electronic zoom lens features Autofocus and SuperSteadyShot with an MTF 12X high quality optical lens with manual Zoom, Focus and Iris control.
- High resolution (500 lines) B&W viewfinder and a color swing out bright color LCD panel are included



- Built-in slot for a flash memory card or Memory-Stick for still image storage. Up to 988 JPEG pictures can be stored in one 64 MB MemoryStick. The stored images can be mixed or keyed to the live image allowing logo insertion and/or mix effects.

**Sony DSR-PD150 List Price .....\$4,000**  
**For B&H price .....Call**

## JVC

### GY-DV500

#### 1/2-inch 3-CCD Professional DV Camcorder

The world's first DV camcorder designed from the ground up for professional ENG work, the GY-DV500 combines the convenience and cost-effectiveness of Mini DV with the performance and features you need. It incorporates three 1/2-inch 380,000 pixel IT CCDs for superior picture performance (equivalent to 750 lines of resolution) superb sensitivity of F11 at 2000 lux and minimum illumination of 0.75 lux (LoLux mode). Ruggedly constructed with a rigid diecast magnesium housing providing the durability professionals crave, the GY-DV500's compact design and light weight (less than 11 lbs. fully loaded) makes it extremely portable. Additional features like the menu dial and Super Scene Finder assure ease-of-use and shooting flexibility, while the IEEE1394 and RS-232 interface allow integration into various non-linear and post-production systems. A professional camcorder in every sense, the compact, lightweight GY-DV500 redefines acquisition for corporate, educational, cable and broadcast production, as well as wedding videography and multimedia applications.

#### Professional Specifications

- Applies JVC's DSP with advanced 14-bit video processing to bring out more natural details, eliminate spot noise, accurately reproduce dark areas, and restore color information in dark areas.
- CCDs are equipped with advanced circuitry to virtually eliminate vertical smear when shooting bright lights in a dark room. Ensures efficient light conversion with a sensitivity of F11 at 2000 lux.
- CCD Defect Correction function evaluates white defects with the lens closed and then stores their addresses in memory. When the camera is turned on, the data is sent to the DSP for storage and real-time correction.
- Black Stretch/Compress function ensures accurate reproduction of black areas on the screen. Advanced color matrix circuits give even difficult images a very natural appearance.
- Multi-stream parallel digital pipeline processing at 40 MHz creates an ultra-smooth gamma curve, calculated using a true log scale algorithm. The result is a dynamic range of 600% to accurately reproduce fine details and colors in shadows or highlights.

#### Professional Performance

- Multi-zone iris weighting system gives priority to objects at the central and lower portions of the picture for accurate auto exposure under any condition, even if a bright subject moves into the picture.



- Adjustable gamma for adjusting the "feel" of the picture according to taste. Adjustable detail frequency for setting picture sharpness for a bolder or finer look.
- Viewfinder status display shows characters and menus to display selected information, including audio indicator, tape and battery remaining time, VCR operation and warning indicators. Camera settings and setup parameters can also be checked at a glance. A built-in menu dial lets you quickly navigate through the viewfinder menu.
- Highlight Chroma Processing maintains color saturation in highlights. The result is natural color reproduction, even in bright highlight portions of the picture.
- Smooth Transition mode ensures a smooth transition with no jump in color or light level taking place when manually changing gain or white balance settings

#### Professional Audio

- To complement its superior video performance, the GY-DV500 offers outstanding digital PCM sound. You can choose between two 16-bit 48-kHz channels or two 12-bit 32-kHz channels with a dynamic range of 85 dB.
- In addition to camera mounted mic, has two XLR-balanced audio inputs with 48V phantom power and manual audio control. Phantom power can be switched off when not in use.
- Side-mounted speaker lets you monitor audio in playback and recording modes without headphones. The speaker also delivers audible warnings.



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## SONY

### DSR-250 3-CCD DV & DVCAM

Introducing everything you need in an event camera and more. The digital DSR-250 from Sony is a high image quality reduced size camcorder which has been optimized for shooting events and parties. Every feature you could want is included in this revolutionary acquisition tool.

- **1/3 inch x three 380K pixel** (effective 340,000 pixels) CCD's that allow two scanning modes: 480 progressive (for still) or interlaced (for video). They also provide high quality acquisition with increased resolution and sensitivity at reduced noise and vertical smear. • One touch auto focusing in manual focus mode.
- **530 lines of horizontal resolution**, allowing you to capture your subject with tremendous detail.
- **Switchable aspect ratio** 4:3 (TV mode) or 16:9 (Movie mode)
- **DXF-801 high resolution 1.5" black & white viewfinder** (same as on DSR500/1 & DXC-D35) enables easier focusing. Automatic switches from 4:3 aspect to 16:9.
- **Records in DVCAM or DV**, standard tapes or mini. Up to 270 minutes recording in DV mode onto a 184 min. DVCAM tape.

- **Flip out 2.5" 200,000 dot LCD monitor**, finally available on a professional camera • Time date stamp • Soft shoulder pad.
- **58mm lens with 12x optical zoom**.
- **Advanced optical stabilization** allowing for a high quality digital zoom out to 24x, with a maximum digital zoom out to 48x
- **Assignable time code** (Rec Run, Free-run, User-bit)
- **16 bit 2 channel audio recording**, or 12 bit 4 channel.
- **Digital in/out** (IEEE1394) and **analog in/out**.
- **Still image capture onto memory stick** • Upload graphics from memory stick or USB adapter, software included
- **Phantom 48V power** • Built in speaker • Directional microphone in pro mic holder, 2 XLR audio inputs • **Wireless remote** •
- **Built in edit controller**. Equipped with an i.LINK interface, allowing camcorder to serve as edit player or recorder.
- **External 12V supply/Connection for light**. The DSR-250 is equipped with light output (DC 12 V, maximum 30 watts).

Sony DSR-250 List Price .....\$5,900  
For B&H price .....Call



### DSR-300A 3-CCD Digital (DVCAM) Camcorder

Inheriting many of the same features and functions as the DSR-130, the affordable DSR-300A actually extends operational convenience with a range of new features and peripheral products. Remarkably compact and lightweight, the improved DSR-300A provides high mobility without compromising picture quality and can be held comfortably on your shoulder through the longest shoots and gives videographers the ability to acquire their footage quickly and easily.

- **LSI Digital Signal Processor** (the very same one used by the DXC-D30 cameras) for a high signal-to-noise ratio of 62 dB.
- **Both mini cassettes (PDVM series) and standard cassettes (PDV series) can be used with the DSR-300A**. With PDV-184ME (standard), a maximum recording time of 184 minutes can be achieved. They can also play back tapes recorded in the consumer DV format
- **For operational convenience** while shooting, the Time Code is superimposed on the viewfinder screen or MONITOR OUT screen, even during playback
- **DXF-801 viewfinder** featuring variable peaking, 3 level light light and a white LED light with 2 levels of intensity to illuminate the lens setting • IEEE1394 i.LINK (out only)

Sony DSR-300A List Price .....\$9,900  
For B&H price .....Call



### DSR-11 Compact DVCAM VTR

- Compact desktop DVCAM recorder. This VTR provides a powerful and cost-effective option for NLE editing systems. Provides basic VTR features, along with an i.LINK (IEEE1394) interface and is compatible with both NTSC and PAL color systems. Designed to be used in either a horizontal or vertical position. A footprint of only 2 3/4" in the vertical position.
- The DVCAM format uses 8-bit component digital recording at 25 Mbps, with Intra-frame 5:1 compression, 500 lines of resolution and 4:1:1 color sampling. A 15 micron track pitch provides superior picture quality, superb multi-generation capability and production flexibility. Two 1/4" ME cassette sizes are available: Standard and Mini.
  - **Plays and records either a DVCAM format signal or a DV format signal.** • Both Mini and Standard size cassettes can be used with the DSR-11 without the need of an adaptor

- **Play or record in either the NTSC or PAL color systems.**
- **Equipped with a 4-pin i.LINK (IEEE-1394) interface**, for lossless transfer of digital video and audio information with other IEEE-1394 equipped devices. The single 4-pin i.LINK cable can be connected to MAC or PC based NLE systems or to another VTR for degradation-free editing.
- **DV EE (electronics to electronics) Out**: Analog input signals can be converted into digital signals, and can be simultaneously output from the i.LINK interface.

DSR-11 .....List Price \$2,600 For B&H price...Call

### DSR-20/40 DVCAM Player/Recorders

The DSR-20 and DSR-40 are versatile DVCAM VCRs with compact chassis and a variety of convenient functions for recording, playback and simple editing. They feature Auto Repeat Playback, Power-On Recording/Playback, multiple machine control interfaces and i.LINK (IEEE1394) input and output. And, of course, they offer the stunning image and sound quality inherent to the DVCAM format.

- **i.LINK** They both offer i.LINK (IEEE1394) input/output. In addition, in the "Digital Dubbing including TC Copy" mode, full information of video, audio and time code of the original tape can be copied to another tape. Especially useful when making working copies of the original.
- **Inputs and Outputs** They provide a full range of analog video inputs and outputs for integration into current analog-based systems. They both offer composite and S-Video input/output, while the DSR-40 (only) offers a component output as well. The DSR-20 is equipped with analog audio inputs and outputs (RCA), the DSR-40 with RCA inputs and XLR-balanced output. These connections in combination with their i.LINK interface allow a smooth transition to an all digital system in the future.
- **Record/Playback Functions** Automatic repeat function for repeated playback. After reaching the end of the tape, the DSR-20/40 automatically rewinds the tape, then starts playing back the segment again.

- They are capable of searching for Index Points, which are recorded on the tape as "in-point" marks every time a recording starts. They can also search for photo data recorded on a DVCAM cassette by the DSR-20/40/300/PP-100, or where the recording data has been changed.
- **Reference Input** External sync input enables synchronized playback with other VCRs. Especially important in A/B Roll configurations. In addition, the DSR-40 only allows adjustment of H-sync and SC phase via the menu.
- **Control S Interface** The DSR-20/DSR-40 have a Control S input allowing control via the optional DSRM-20 Remote Control.

DSR-20 .....List Price \$3,950 .....For B&H price...Call

DSR-40 .....List Price \$5,100 .....For B&H price...Call

- **DSR-20 Only** • The DSR-20 can be powered by AC or DC.
- **Equipped with Control L interface**, the DSR-20 can perform simple Time Code-based editing when connected to another DSR-20 or other similarly equipped VCRs/cameras.

- **DSR-40 Only** • Equipped with an RS-422A interface, it can perform as the editing player in A/B roll or cut editing system.
- It also has a simple recording function which can be controlled

- In addition to Control L, the DSR-20 also incorporates an RS-232 interface for remote control of basic VCR functions from a PC.
- **Supplied with the RMT-DS20 Wireless Remote** for control of basic VCR functions.

- either manually or via its RS-422A interface.
- The DSR-40 is not equipped with a synchronization capability, the editing accuracy is performed by pre-roll and play.

## Apple Authorized Reseller Power Mac G4

Simply the fastest desktop computer ever, the G4 is designed for creative professionals who use computers as the pivotal tool of their trade, setting the pace of their work, their productivity, even their success. It features the revolutionary PowerPC G4 with Velocity Engine, which crunches multimedia data at blazing-fast speeds. The Velocity Engine uses true independent vector processing-a technology originally developed for use in scientific supercomputers. The result is unprecedented productivity for creative professionals-in the arts as well as the sciences. With its Pentium-crushing speed (easily running up to a stunning 50% faster than a 1000MHz Pentium III-based PC), the new Power Mac G4 picks up where the best-selling original Power Macintosh G4 left off.

### Features

- 1 MB of backside level 2 cache running at half the processor speed
- ATI RAGE 128 graphics card with 16MB of graphics memory supporting up to 1200x1600 resolution
- Support for up to 1.5GB of PC100 SDRAM
- Support for more than 200 GB of internal hard disk storage

- Four expansion slots including Three 64-Bit PCI slot and one Graphic card slot
- Two 400-MegaBit-per-second FireWire ports for connecting Digital Video Cameras, hard disk drives and other high speed multi media peripherals
- Two USB (Universal Serial Bus) ports for connecting up to 127 peripherals

### G4/466 (M7627LL/A)

- 466MHz G4 processor speed
- 128 MB SDRAM memory
- 30GB ultra ATA/66 Hard Drive
- DVD-ROM Player/CD-RW
- Two firewire 400-Mbps ports
- Two USB 12-Mbps ports
- 10/100/1000 BASE-T Ethernet card • Built-in 56K modem

### G4/533 (M7688LL/A)

- 533 MHz G4 processor
- 128 MB SDRAM memory
- 40GB ultra ATA/66 Hard Drive
- NVIDIA GeForce Graphics card
- DVD-ROM Player /CD-RW
- Two USB and Two Firewire ports
- 10/100/1000 BASE-T Ethernet card

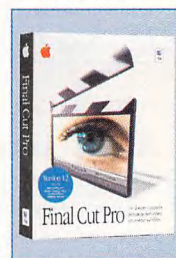
### G4/667 (M7945LL/A)

- 667 MHz G4 processor
- 256 MB SDRAM memory
- 60GB ultra ATA/66 Hard Drive
- DVD-ROM Player /CD-RW Writer
- Two firewire 400-Mbps ports
- Two USB 12-Mbps ports
- 10/100/1000 BASE-T Ethernet card

## Final Cut Pro Professional Editing, Compositing and Effects Software for Macintosh

A breakthrough in non-linear video, Final Cut Pro combines professional editing, compositing, and special effects in one powerful application—turning a Power Macintosh into a powerful workstation. Designed from the ground up for DV, Final Cut Pro offers the easiest way to transfer material from DV sources to your hard disk; edit, composite, and add effects to the video and audio; and play the results. It has an advanced feature set that professionals will love, yet it's also easy enough for novice video producers who are just discovering DV and FireWire. Final Cut Pro supports DV and all QuickTime formats, including M-JPEG and web-ready streaming video. It provides plug-and-play capabilities with most digital video cameras. It supports unique DV features such as non-square pixels and audio/video interleaving. Just connect your computer to a DV camcorder, capture video and edit it with sophisticated tools such as three-point editing, match frame, and multitrack trimming. Create multiple layers of video using text, graphics, or additional video elements. Each layer can be still, or animated along a user-defined path using tools such as Bézier curves with acceleration control. Apply time-varying filter effects, such as blur, to any layer, and mix and synchronize multiple audio tracks—up to 99 tracks per movie. Then you can output your results for TV, videotape, QuickTime movies, or the Web.

Final Cut Pro is Compatible with the Pinnacle MiroMotion DC30 for analog capture. And with the Aurora Igniter Card for analog and Component capture.



### Good System .....\$4,799.95

- Includes:
- Apple G4/466 Computer
- Final Cut Pro version 1.25 editing software
- Total of 256MB of memory
- 30GB of ATA/100 storage
- CD-RW rewritable CD writer
- Final Cut Tutorial CD
- Mitsubishi Diamond Pro 2040 22" Monitor
- Apple Care-three year warranty
- Complete System integration and testing

### Great System .....\$5,699.00

- Includes:
- Apple G4/533 Processor
- Final Cut Pro version 1.25 editing software
- 60GB of ATA/100 storage
- Total of 256MB of memory
- CD-RW rewritable CD writer
- Artel Boris Graffiti CG Program
- Final Cut Tutorial CD
- Mitsubishi Diamond Pro 2040 22" Monitor
- Apple Care-three year warranty
- Complete System integration and testing

### Best system .....\$7,999.00

- Includes:
- Apple G4/533 Processor
- Final Cut Pro v1.25 editing S/W
- 150GB (2x75) of ATA/100 storage
- VST Ultratrek IDE controller card
- ATI Rage Orion dual display card
- Total of 256MB of memory
- Artel Boris Graffiti CG Program
- Final Cut Tutorial CD
- 2 Mitsubishi Diamond Pro 2040 22" Monitors • CD-RW writer
- Apple Care-three year warranty
- Complete System integration and testing

### Optional Accessories

- 45GB 7200 RPM Ultra ATA/100 Hard drive .....\$299.95
- 60GB 7200 RPM Ultra ATA/100 Hard drive .....\$449.95
- 75GB 7200 RPM Ultra ATA/100 Hard drive .....\$599.95
- E2-Quest 30GB 7200 RPM Ext. Firewire drive .....\$299.95
- E2-Quest 60GB 7200 RPM Ext. Firewire drive .....\$599.95
- E2-Quest 75GB 7200 RPM Ext. Firewire drive .....\$849.95
- 128 MB memory module .....\$99.95
- 256 MB memory module .....\$199.95
- Imation 3.5" Floppy Drive .....\$99.95
- Keyspan USB to Serial Adapter .....\$89.95
- Griffin iMate USB-A/D Adapter .....\$49.95
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CineWave delivers compressed or uncompressed video and balanced or unbalanced audio ranging from NTSC/PAL, CCIR-601 or HD, YUV or RGB, 4:2:2 or 4:4:4, interlaced or progressively scanned, using aspect ratios of 4:3 or 16:9 to output to tape, CD, DVD or streaming media files using Pinnacle's unique memory-centric architecture. The CineWave also has real-time 3:2 pull down for 24-30fps conversion. At the base of this system is Pinnacle's new Targa Cine Engine with two Digital Tether ports for plug and play capabilities to easily upgrade the CineWave from analog to serial digital or from standard definition to high definition with optional breakout boxes.



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## DigiEffects CineLook

Film Simulator Plug-in for Adobe Effects

CineLook is a revolutionary tool that takes any video, computer animation, film-scan or photo and allows you to add grain, correct color and add film artifacts like dust, scratches, stains, hair and more. CineLook is designed for video producers who need to match video footage or 3D animation with film footage or to get that "film look" by adding film-grain to video or computer animation. It can also reduce film grain to better integrate scenes in film production. CineLook allows you to take any video footage (S-VHS, Hi-8, Betacam SP, DV) and make it look like film by emulating all of the popular film-stocks and performing advanced color correction. It uses the enhanced timing controls in After Effects to convert 30 fps footage to 24 fps in order to simulate 35mm and 16mm film, and 12 fps for 8mm film. This process is known as "inverse-telecine" and is integral to achieving the "film look". CineLook uses several other technologies, including StockMatch, which adds grain to the RGB channels separately, Chromamatch, a color matching and correction system, and TimeMatch an advanced time matching system, that simulates the shutter blur of film thus creating a softer, more filmic appearance to video footage than what can be achieved by AE.) CineLook is available in two versions, Broadcast and Film Res. And is available for both Windows and Mac. Broadcast version limited to 768 x 576 pixels (D1). Film Res version adds a de-grain filter, and works up to 4K by 4K resolution.

\$659.95

## Delirium Plug-in for after effects

An amazing set of plug-ins for After Effects. Delirium has over 45 separate tools that will make your video and motion graphics work stand out. Create natural phenomenon like snow storms with flakes that fall naturally on any logo or image. Or generate spectacular particle-based "fire" and "smoke" as well as lens flares, motion graphic elements, gun muzzle flashes, lighting effects and much more!

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## Cinemotion

Tools for Simulating Film Motion, Controlling Noise and More

CineMotion is a set of 10 plug-ins for After Effects MacOS that allows you to take any video footage (S-VHS, Hi-8, Betacam, DV) and make it move like film, reduce or enhance grain, diminish interlace flicker, create film-aspect ratios, perform posterization effects and lessen color banding artifacts. All plug-ins have presets, so you can get started quickly. You can also save your own presets, and trade them with others or use the on other projects. CineMotion was designed to allow video producers to give their productions the motion of film with complete flexibility and control. CineMotion is a great companion to DigiEffects award-winning product, CineLook. The Film Motion plug-in creates a much enhanced version of the standard 3:2 pulldown for After Effects.

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## Video Toaster Tools for Broadcasting and Beyond

With a suite of tools for video creation including all the essential components for video editing, compositing and 2D/3D animation, the Video Toaster is an uncompressed D1 (composite, component, Y/C) Windows NT solution that offers a price/performance equation unmatched in the industry. Unique to the Video Toaster is a breakthrough technology developed by NewTek that turns a standard Pentium II or III processor into a highly specialized video DSP (digital signal processor) for time base correction and other capabilities typically associated with expensive custom chips. Superior to systems that cost tens of thousands of dollars the Video Toaster includes LightWave V7 3D animation software, Aura paint and compositing software and in-syncs Speed Razor 4.5 SE video editing software. Leveraging over 12 years of experience as an industry leader and pioneer in the desktop video, 3D, and 2D paint and animation markets, NewTek has created a product that contains award winning tools for creating better than broadcast quality television...at an unbeatable price!



### Uncompressed Video—No Compromises

- The Video Toaster offers quality that's second to none. ALL video is ALWAYS stored in its native, uncompressed D1 video format. Unlike other boards that show compression artifacts, the Video Toaster maintains the original pristine quality no matter how many layers in your project.
- The Video Toaster allows you to manipulate uncompressed video in many ways, including traditional 2D compositing, rotoscoping, 3D animation and modeling and editing. By merging video into a 3D compositing and animation environment, editors will find a new paradigm for video effects and manipulation. The quality and capabilities of the Toaster are comparable or better than digital video editing costing \$50,000 to \$100,000.

### Powerful Editing

- Video Toaster includes in-syncs' powerful editing application, Speed Razor 4.5 SE.
- Project timeline that lets you easily create professional video projects containing unlimited layers of video, audio, still image files and animation.
- Comprehensive 2D compositing system

### Toaster Utilities

- **VT Director**—Allows any program that supports cut and paste to build an image on a NTSC or PAL video monitor. Imagine working in Photoshop and being able to display your work on a video monitor with one keyboard shortcut.
- **ToasterVision**—Allows you to preview both video input and output as well as animation on your RGB monitor at 720 x 480 resolution and full frame rate—60 fields per second.

### Continuously Upgradeable—Guaranteed Against Obsolescence

The Video Toaster was designed to last for years to come. Similar to the original Video Toaster for Amiga, which is still in production 10 years after its introduction, the Video Toaster utilizes a hardware system that leverages highly tuned software and the systems processor. The true power of the system comes from the proprietary software designed to create magic without the use of expensive video cards or bulky external hardware. By merging software and hardware, the Video Toaster can be upgraded and expanded well beyond current systems. NewTek will be adding modules for a real time 16-input switcher, DV I/O, storyboard editing, and real-time chroma keying and 3D DVE.



## NewTek LightWave [6]

3D Animation, Modeling and Rendering Software

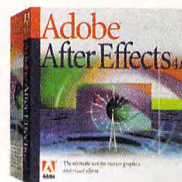
Explosive ideas that test the boundaries of 3D animation deserve a program that can realize them in exciting new ways. Creating worlds that no one's ever seen. Creatures that have never walked the Earth. Special effects, games, web sites - all creations that exist only in your mind. Until now.....

The culmination of over ten years of development, LightWave [6] advances the state-of-the-art in professional 3D animation by adding a comprehensive set of groundbreaking character animation tools, advanced rendering capabilities, a new and improved architecture and a refined work environment. The three traditional areas of 3D, modeling, animating and rendering, have received massive enhancements in the new software. Among the thousands of changes in this completely redesigned system, LightWave [6] boasts real-time subdivision surfaces as a modeling and animation tool, radiosity, caustics, 160-bit floating-point rendering, a hybrid Inverse/Forward Kinematics engine and new character-animation technologies: LightWave, the recognized leader in the film and television industry, provides the most complete feature set of any 3D animation tool available—one of the reasons you can find LightWave 3D in more Hollywood animation suites than any other 3D program. And, LightWave [6] is the only 3D software system to run on Macintosh, Windows NT, Alpha and SGI.



## After Effects The Ultimate Tool for Motion Graphics and Visual Effects

The industry-standard for professional motion graphics, After Effects is the most powerful tool available for producing unlimited composites, fluid animations and sophisticated special effects. After Effects is also resolution independent (up to 4000 x 4000 pixels) so its the ideal design tool for film and video producers, graphic designers, multimedia professionals and Web developers. Produce stunning special effects for broadcast, film, video, multimedia, and on-line production right from your desktop. Create animations for openers, bumpers, on-air promos, commercials, music videos, titles, games, and more. When compositing, After Effects produces results that meet even the most exacting standards. Control layers with stunning precision. Combine unlimited layers of moving and still images. Produce sophisticated audio and visual effects with more than 75 effects plug-ins. Create adjustment layers to apply effects to multiple layers simultaneously. Add any number of keyframes, animate and apply special effects to each layer, and adjust those layers until the composite looks and moves exactly the way you want. Enjoy precise control over every aspect of your composite from sub-pixel positioning to controlling the shape and velocity of each animation path. Use the new RAM Preview function to check how compositions play back-in real time. Only when you are totally satisfied do you output a project for final delivery. Available for Macintosh and Windows 98/NT, After Effects is tightly integrated with the Adobe product family, so if you work with Photoshop, Illustrator, and Premiere, you already have the skills, shortcut know-how, and hardware you need to make Adobe After Effects a seamless, powerful extension of your creative arsenal. When you import Photoshop files, After Effects preserves layers, alpha channels, and transfer modes—you can then animate each Photoshop layer over time. Imported Illustrator files remain in vector format until you output your final composition, so you can scale these graphics to any size while maintaining the crisp detail of the original artwork. After Effects and Premiere can import each other's movies.



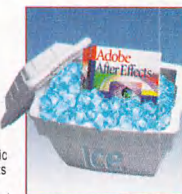
## Ice.

### After Effects on ICE Motion Graphics and Visual Performance Card

After Effects 'On Ice' provides blink-of-the-eye interactive responsiveness and lightning fast rendering across the entire application, not just with plug-in special effects filters. It gives users greater freedom to experiment in any compositing task, to perfect the right look, to complete more projects, and most important, to gain a vital edge. Along with a palette of awesome ICE effects, a must-have tool for After Effects users, AE on ICE adds performance where it is needed most—the core AE functionality of Geometrics, Compositing, and Motion Blur. So no matter if you are creating simple composites or intensive special-effects projects.

Basic Edition includes Basic BlueICE board, After Effects Production Bundle, ICE'd After Effects Application and ICEFX—ICE's own award-winning tool set for After Effects. Ultra Edition adds Ultra BlueICE hardware for the most powerful graphics performance available on the desktop. It also includes an assortment of popular plug-in applications for After Effects. These include an ICE'd DigiEffects CineLook, ICE'd Final Effects Complete and ICE'd Edges.

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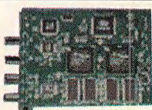


## Basic BlueICE/ Ultra BlueICE

Hardware Accelerator Cards for ICE'd Effects

The BlueICE video processing hardware is the cornerstone for the ICE family of graphics-intensive visual effects and media compression tools. With four Phillips TriMedia 1300 processors, the Basic BlueICE card has a combined computer power that exceeds a workstation with multiple 400 MHz Pentium processors. When applications get "ICE'd" they take advantage of BlueICE's multi-processing hardware to achieve performance gains of 2x to 50x compared with un-ICE'd software. Visual effects are rendered faster and files are compressed faster.

- The Basic BlueICE board works in both Mac and Windows NT systems and includes an interface to support an optional BlueICE SDI video daughter card. Basic BlueICE is also field-upgradable to Ultra BlueICE with a simple snap-on daughter card.
- With eight TriMedia processors, Ultra BlueICE hardware delivers up to twice the speed of Basic BlueICE for the ultimate in performance—creating stunning graphics and publishing digital video for broadcast, CD-ROM or web distribution.



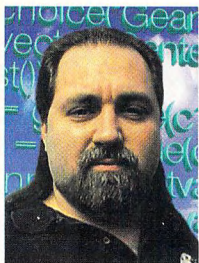
## BlueICE SDI Video Daughter Card

- A revolutionary option for uncompressed video capture and playback, BlueICE SDI Video daughter card attaches to either Basic or UltraBlue cards eliminating the need for extra PCI slots devoted to video cards. The BlueICE SDI Video card provides SMPTE 259M video capture direct to disk. It provides frame-accurate deck control and captures QuickTime compatible media.
- Real-time capture of SMPTE 259M video from your tape deck, fully integrated within the After Effects environment.
- Uncompressed video footage is stored directly to disk with no compromise in video quality.

- QuickTime format for seamless integration with your After Effects projects.
- Video monitor output for viewing during creative iterations. When you are satisfied with the results, you can layoff directly to tape—uncompressed and real-time—all from within the After Effects environment.
- Frame-accurate VCR control through the remote serial port VCR control software. Capture the exact footage you want to work within your After Effects project. The deck control interface for capture and playback is integrated right into the After Effects user interface.

1,399.95





## FILL IT TO THE BRIM

by Bob Hood

## LScript Stacks Up

**R**ecently, a LightWave user contacted me about an interesting — and likely common — problem. He needed to create a pile of coffee beans lying next to a coffee can (and I'm *still* waiting for that final render, Tony =|/).

Of course, he could have done it by hand, but stacking beans is hardly an efficient use of his time. Filling an arbitrary volume with multiple instances of an arbitrary object perfectly exemplifies

ities. This “fish bowl” mesh occupies layer #1 in the object.

The “marble” mesh that will be used to fill the bowl's volume also resides in this object, but in a different layer, in this case, in layer #5.

### Fill ‘Er Up!

Listing 1 showcases this issue's script, appropriately titled “Fill Arbitrary”.

To begin, lines 6 and 7 take a snapshot of the current layer settings using `lyrf()` and `lyrbg()`. The script will be altering these settings to perform its functioning. By remembering the exact arrangement of layers, the script can properly restore them when it finishes.

Lines 9 and 10 initialize working values. The `maxObjects` variable holds the maximum number of fill objects that will be generated within the fill volume. This value is not guaranteed to be exact — a number slightly less than this likely will be generated.

The `objectLayer` variable contains the layer number that houses the mesh used to fill the volume in the currently active foreground layers. You can easily modify the script to implicitly use the data found in the active background

layers as the fill mesh. (I leave this as an exercise for you to undertake.)

Lines 12 - 22 present the user with a simple requester that allows them to alter the script's working values. Pay particular attention to the fact the script no longer performs any error handling in the call to `reqbegin()`. In the LScript v1.x system, this call, as it is, would have used Modeler's internal requester mechanism instead of the LightWave Panels global plug-in.

However, with the release of LightWave [6], the Panels global plug-in has become an internal LightWave subsystem, guaranteed to always be available to plug-ins. LScript v2.x has been redesigned to take advantage of this fact, and all requesters now use the Panels global by default. Error checking has become a thing of the past with regard to `reqbegin()`.

To ensure that components do not exceed the bounds of the fill volume, lines 24 through 31 calculate a differential between the size of the volume and the mesh that will fill it.

First the bounding volumes of both meshes are calculated. From this information, the linear distance between the farthest points of the bounding box are determined using the LScript `vmag()` function. The ratio between these distances, calculated on line 31, will provide a scaling factor by which we will reduce the resulting population spread.

This reduction is done to increase the

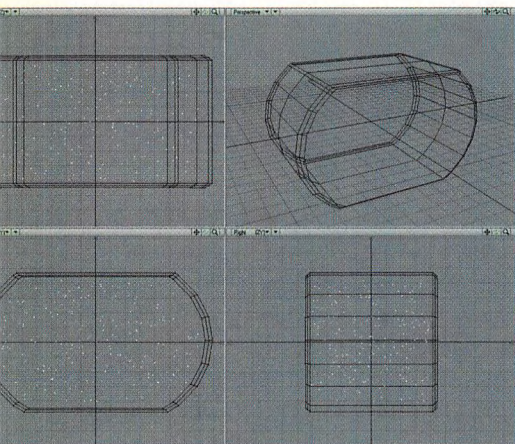


Figure 1

the usefulness of a scripting language and can prove a handy tool in the modeler's arsenal. This issue's script provides some basic functionality for performing this task, and can serve as a good starting point for generating a more sophisticated solution.

Figure 1 shows the volume we will use to demonstrate the script's capabil-



chances that no fill object exceeds the bounds of the fill volume. Unless the bounding volumes are perfect ratios of one another, a small error amount will creep into the calculations, which will manifest as small portions of the fill mesh exceeding the bounding volume. This error amount could be calculated and factored out of the scaling value, but I have chosen to leave it in so you can visually see the result.

## Making Your Points

The next segment of the script (lines 33 - 54) generates randomly placed points within the correct bounding volume, which subsequently, will be replaced, each with an instance of the fill mesh.

I am using points as placeholders instead of doing a direct placement of the fill mesh at each position because a call will be made later to the LScript `scale()` function to bring the population within the boundaries of the volume. A scaling on a multi-point mesh will alter the size of that mesh, but single-point polygons are unaffected by any sizing that a `scale()` call might create. Only their positions will be changed.

Next, the call to the `move()` function (line 54) ensures the newly generated points are positioned squarely within the bounding box of the volume. The results of a call to `center()` on the volume's bounding parameters is passed to `move()` to properly place the placeholder points.

Lines 56 and 58 perform the functions of molding the points

into the bounding volume. The call to `boolean()` clips the single-point polygons, discarding all not within the bounding volume itself. Finally, the remaining points are compressed into the correct volume through a call to `scale()` function. (Figure 1)

The remaining script code performs a point-by-point substitution of the fill mesh found in the layer specified by the user. The final point positions are gathered into an array of vectors. Then, the points are deleted. (Lines 60 - 69)

A loop is used to copy instances of the fill mesh from its residence into

an empty layer. Here it is positioned at one of the many placeholder locations, and then transported into a layer used to accumulate the fill meshes. (Lines 71 - 94) Finally, on lines 96 and 97, we restore the user-defined layer arrangements.

Figure 2 was generated using the values of 200 for `maxObjects`. A few of the fill meshes have slightly exceeded the boundaries of the volume. If you're using LightWave to generate the blueprints for NASA's next reusable launch vehicle, you'll need to account for this.

Otherwise, be happy. =|^(



## Listing 1 - Fill Arbitrary

```
001: @warnings
002: @version 2.0
003:
004: main
005: {
006:     fg = lyrfg();
007:     bg = lyrbg();
008:
009:     maxObjects = 200;
010:     objectLayer = 5;
011:
012:     reqbegin("Arbitrary Fill - Bob
Hood");
013:
014:     c1 = ctinteger("Maximum
objects",maxObjects);
015:     c2 = ctinteger("Fill mesh
layer",objectLayer);
016:
017:     return if !reqpost();
018:
019:     maxObjects = getvalue(c1);
020:     objectLayer = getvalue(c2);
021:
022:     reqend();
023:
024:     (blo,bhi) = boundingbox();
025:     bdist = vmag(bhi-blo);
026:
027:     lyrsetfg(objectLayer);
028:     (flo,fhi) = boundingbox();
029:     fdist = vmag(fhi-flo);
030:
031:     scl = fdist / bdist;
032:
033:     (e1,e2) = lyrempty();
034:
035:     lyrsetfg(e1);
036:     lyrsetbg(fg);
037:
038:     pt = <0,0,0>;
039:
040:     editbegin();
041:
042:     for(x = 1;x <= maxObjects;x++)
043:     {
044:         pt.x = (2.0 * randu() - 1.0) *
((bhi.x - blo.x) / 2);
045:         pt.y = (2.0 * randu() - 1.0) *
((bhi.y - blo.y) / 2);
046:         pt.z = (2.0 * randu() - 1.0) *
((bhi.z - blo.z) / 2);
047:
048:         pid = addpoint(pt);
049:         addpolygon(pid);
050:     }
051:
052:     editend();
053:
054:     move(center(blo,bhi));
055:
056:     boolean(INTERSECT);
057:
058:     scale(scl - 1.0);
059:
060:     maxObjects = editbegin();
061:
062:     ppos = nil;
063:
064:     for(x = 1;x <= maxObjects;x++)
065:         ppos[x] = pointinfo(points[x]);
066:
067:     editend();
068:
069:     delete();
070:
071:     moninit(maxObjects);
072:
073:     for(x = 1;x <= maxObjects;x++)
074:     {
075:         lyrsetfg(objectLayer);
076:
077:         copy();
078:
079:         lyrsetfg(e2);
080:
081:         paste();
082:
083:         move(ppos[x]);
084:
085:         cut();
086:
087:         lyrsetfg(e1);
088:
089:         paste();
090:
091:         last if monstep();
092:     }
093:
094:     monend();
095:
096:     lyrsetfg(fg);
097:     lyrsetbg(bg);
098: }
```

(You can download the LScript from the Bonus section of [www.newtechniques.com](http://www.newtechniques.com))

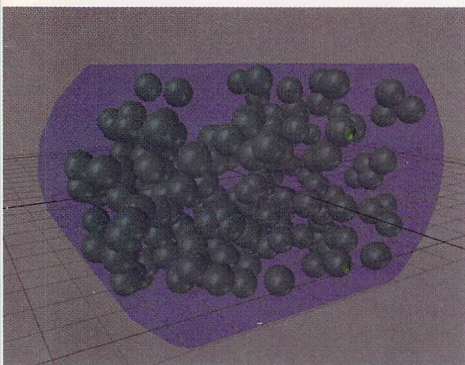


Figure 2



# Tutorial

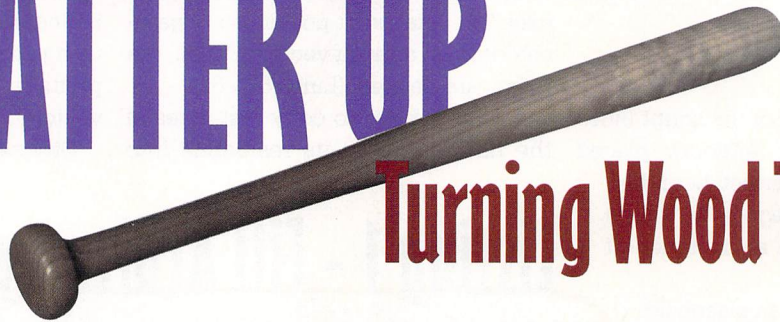
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A STEP-BY-STEP GUIDE TO CREATING MORE PROFESSIONAL PRODUCTIONS

## BATTER UP

by  
Brad Gordon



## Turning Wood Textures

**S**urfacing is half the game when it comes to realism. You can possess the best modeling skills in the world; but without good surfacing techniques, your prize creation will look plastic at best. On the other hand, a weak model can look stunningly realistic with good surfacing, lighting, and camera work.

Wood remains one of the basic building materials in this world; and unless you only are modeling spaceships, mastering wood textures will prove invaluable. In this baseball bat texturing tutorial, you will create a surface that you can use on *all* of your wooden models with only minimal changes.

As a starting point, we'll be using the "Wood" procedural texture provided by NewTek. I prefer the procedural textures over images because they take up less memory, and in the long run, are easier to use, modify, and improve. Also you won't need to spend time searching for the perfect texture map image. Indeed, with a few guidelines and a little tweaking, procedurals can yield an amazing array of realistic textures.

**1.** O.K. let's get started. Before we build the baseball bat, we want to concentrate on making a decent hard wood texture. Go to Modeler and create a cube using the [Box] tool and typing the [n] key to bring up the numeric panel. Enter the following dimensions:

X: -5 cm, 5 cm, 1; Y: -5 cm, 5 cm, 1; Z: -5 cm, 5 cm, 1.

Click OK. This will make a piece of wood that

can fit in the palm of your hand. Select the [Surface] tool from the [Polygon] tab or type [q] and apply a surface called "MyWood." Click on and highlight the [Smooth] button (we'll need it later).

Save this object as "Wood\_Ash.lwo" and load it into Layout.

**2.** In Layout open the [Options] Panel and click on the [General Options] tab. Use the following settings: Unit System = Metric, Default Unit = Meter

Position the camera and light so you have three sides of your cube in view. Enter the surfaces panel and change the Samples [Options] to Cube and "0.05."

Select the "MyWood" surface and click the [Surface Color] button.

One of the first mistakes a new 3D artist makes is choosing a light color. Most beginners pick colors from the upper most section of the color picker. Look around your desk. Do you see any colors as bright and perfect as the colors in the upper-most section of the color picker? Doubtful. Instead choose colors from the lower half (I would even go so far as to say the lower quarter) and avoid the upper half.

Very few exceptions to this rule exist. If at all possible, have a real life piece of the surface you are recreating and match the color as closely as possible. You won't make a true-to-life match in the color picker alone. That will require a few more steps, which we'll cover later.

Let's pick a dull brown I'm using 199, 183, 169





Figure 1

would have used the Y-axis. Think of it this way: the axis is determined by which direction you want the grain to go.

If we upped the number of Frequencies, we would start seeing slightly more detail in our rings. I usually stick with the default value of 3, unless a specific need requires more.

Turbulence determines how close one ring can get to another. You really don't need to set this any higher than the Ring Spacing value.

Ring Spacing and Sharpness determine our type of wood. With Spacing, large numbers will tend to give us a softer

wood like pine or balsa, while smaller numbers give us more compact rings and therefore a denser wood like oak and ash.

The opposite is true for sharpness. Ring Sharpness determines the blend from texture color to surface color. The higher the number, the sharper the blend and vice versa. Large numbers will increase the contrast and are better for denser woods. Smaller numbers blend the colors between rings and will give us a softer look, or less contrast.

As a rule, start creating your wood texture by using a large number for your Ring Spacing (0.1) and make sure your Turbulence is the same number. Then start making that number smaller until you get the desired ring size. You'll then change your turbulence to about half of the Ring Spacing value. After these steps are finished, *then* tweak the other values. For more knots, lower the size (X, Y, and Z) of the texture. Remember to make the "grain-axis" at least 4 times larger than the other two.

Perform a test render by pressing [F9] and you should see something like

Figure 2.

Perfect isn't it? And that's a problem. It's not realistic.

Surfaces are not flawless. They aren't perfectly smooth, clean, and shiny. Real life is just the opposite. ALL of your surfaces should have some dirt and grime, bumps and wrinkles, and age.

**4.** So let's improve on the "Wood" procedural texture by adding some imperfections.

Click the [T] button by [Diffuse] and then click the [Add New Texture] button twice. This will give us three diffuse textures to work with. (In 5.6 they are simply numbered. In 6.5, you can assign names.)

Skip "Texture 1" for now and go to "Texture 2." Use these settings:

*Texture 2*

Texture Type: Fractal Noise; Texture Opacity: 32%; Texture Size: 0.5 mm, 0.5 mm, 1.2 mm; Texture Value: 50.0%; Frequencies: 3; Contrast: 1.0; Small Power: 0.5.

The diffuse setting is being abused slightly here. We could add these dirt settings as additional surface color textures. But by creating the dirt this way, you'll have a lot more freedom with future wood projects.

Type [F9] to view this texture. Nice and gritty right? Notice that I stretched the Fractal Noise texture in the Z-axis (or grain axis).

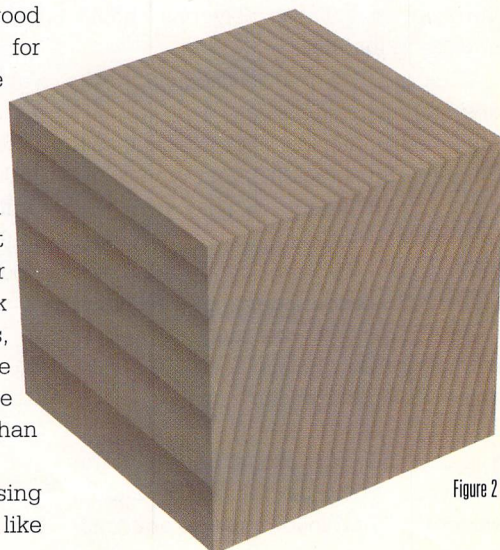


Figure 2

for my color. (Notice where it lies on the color picker.) Note: You can shift-click [Surface Color] and put the numbers in manually.

**3.** Now let's add some texture. Click on the Surface Color Texture [T] button and use the following settings: Texture Type: Wood, Texture Opacity: 90%, Texture Size: 8 cm, 15 cm, 80 cm; Texture Center: 25 cm, -7.5 cm, 15 cm; Axis: Z, Texture Color: 175, 154, 139; Frequencies: 3, Turbulence: 0.0025, Ring Spacing: 0.0045, Ring Sharpness: 4.

I'm offsetting the Texture Center in preparation for the baseball bat that we'll be making. The bat is round and we'll end up with uniform rings crawling along the bat's length if we keep the center zeroed. After the tutorial, reset these numbers to zero and you'll see what I mean.

Choosing the proper axis for the Wood procedural is critical. In Modeler, we'll be aligning our baseball bat on the Z-axis. Therefore, I've chosen the Z-axis for our procedural so the wood grain will be tailored to our baseball bat. If we were building a tree, we



5. Let's add some smudges. (I use this next dirt texture in almost all of my surfaces with very little change.) Go to Diffuse "Texture 3" and use these settings:

## Texture 3

Texture Type: Fractal Noise; Texture Opacity: 36%; Texture Size: 10 cm, 10 cm, 10 cm. (All other settings are the same as the previous texture.)

You really won't see this dirt texture until we apply it to something larger than our little cube. So let's make that bat. First save this surface as "Wood\_Ash.srf" and save your wood block as "Wood\_Sample\_Ash.lwo." Clear this object from the scene.

6. I would love to lathe a Louisville Slugger with you; but this is a texture tutorial, so we'll use the baseball bat that ships with LightWave.

We need to clean it up first. Go to modeler and load the Newtek\objects\sports\baseball\baseballbat.lwo. Select the [Polygon] edit button on the bottom of the Modeler window and use the [Display]/[Statistics] tool (or type [w]). To find any polygons that have more than 4 sides, click the [+] by the [>4 Vertices] line. These polygons should now be highlighted.

Click the [Polygon]/[Triple] tool. Now, deselect all polygons.

To resize the bat slightly, click the [Modify]/[Size] tool ([H]) and type [n] to call up the [Numeric] panel. Enter "90" % and click [OK].

Click the [Polygon]/[Subdivide] tool ([D]) and choose [Metaform]. Click OK.

Finally, resurface the model [q] with a surface called "BatWood." Save this object as "mybaseballbat.lwo."

7. Load the "mybaseballbat.lwo" into layout. Click the [Surfaces] Panel, select the "BatWood" surface, and load

your saved "Wood\_Ash.srf" surface.

Position your camera at:

X -45 cm, Y 48 cm, Z -65 cm, H 41.5, P 35, B 0.

Adjust the light to your liking and press [F9] to take a look.

8. We're still not done. We need a little wax and old sweat.

Click the [T] beside the Surface Color and copy this wood texture by typing [Ctrl] + [C]. Click the [Use Texture] to close this panel.

To give our bat a wax look, slide the Specular up to 9.0%, and click the [T] beside Specular. Type [Ctrl] + [V] to paste the wood texture settings and change the texture opacity to 50%. Using the wood texture will break up the wax in a more natural way. You may not see the highlights until you either rotate your light or your bat object.

9. To add the look of being used for hours of play, click the texture button [T] by Diffuse and select "Texture 1." Use these settings:

## Texture 1

Texture Type: Fractal Noise; Texture Opacity: 100%; Texture Size: 1 mm, 1 mm, 1 mm; Texture Center 0 m, 0 m, -30 cm; Texture Falloff: 0, 0, 225; Texture Value: -20%; Frequencies: 3; Contrast: 0.1; Small Power: 0.5.

Textures are layered top to bottom with the number 1 texture on top. I waited to finish this texture so we could see our grain while building the wood that lies underneath.

10. One more texture and we're home free. We need to add those little dents made from hitting all those homers.

Click the Bump Map [T] texture button and input the following:

Texture Type: Fractal Bumps; Texture Opacity: 100%; Texture Size: 1.2 cm, 1.2 cm, 1.2 cm; Texture Center: 0 m, 0 m, 20 cm; Texture Falloff: 0, 0, 400; Texture Amplitude: 100%; Frequencies: 3.

That's it! Render a huge still with medium or high anti-aliasing and enjoy. (Our bat in the title.)

You can use this wood surface for virtually all of your wooden projects. Keep in mind that you will have to change some of the settings when you want to change the direction of the grain. You will also eliminate the Diffuse "Texture 1" and change the Bump Map.

After you have created this ash surface, try making other wood types like pine, oak, and mahogany. Experiment with recreating multiple grains.

You can use this texturing method to fashion realistic furniture without needing to wrap your objects à la veneer. The Wood procedural works very well with lathed table and chair pieces.

To create chairs and tables, use different surfaces for the separate pieces. Load the "Wood\_Ash.srf" in to each separately named surface and make slight changes to the texture centers. (Remember to change the Specular texture center also.) For bent pieces of wood, start with a straight board and then create a curved morph target. Angled pieces of wood will need morph targets as well (unless you have LW 6.5).

I've given *NewTechniques* all of the objects (as well as the scene file) in Figure 1. Feel free to pick them apart and see how I achieved that beautifully curved grain on the chair's back. You can use these objects in any of your projects. (The object, scenes, and textures can be found in the Bonus section at [www.newtechniques.com](http://www.newtechniques.com).)

Brad Gordon is the Animation Team Leader of USAF Graphics at the Pentagon. His email is [gordonbj@erols.com](mailto:gordonbj@erols.com).





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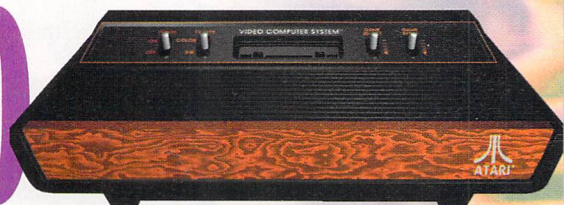
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# Toast Master Flying High

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## STELLA AT 20



by Bohuš Blahut

## An Atari 2600 Documentary

**F**unny thing, when I hear about the latest video games - the breath-taking realism, the pounding soundtracks, the sinewy muscles, the dirigible breasts, and the glut of guts, guns, and gaga explosions - I feel nostalgia for games gone by: the little jagged man swinging on a pixelated vine over a trapezoidal pond full of crocodiles, of tiny tanks sent spinning by a menacingly square missile, and of that crappy version of PacMan that took me so many wasted hours to master.

### Yes, I yearn for the Atari 2600.

Luckily, I am not alone. The Cyberpunks, headed by Glenn Saunders and dedicated to immortalizing "retro gaming," have produced a two volume documentary, "Stella at 20," featuring the luminaries of the original video game movement.

These pioneers narrate the history of video games, focusing on the Atari 2600, affectionately named Stella. You needn't understand the intricacies of Atari technology

to be amazed at these clever people and their ingenious engineering.

Since 1997 marked the twentieth anniversary of the Atari 2600, the Cyberpunks invited many of the original designers to the home of Nolan Bushnell, (the founder of Atari and the

father of the video game industry), to reminisce and celebrate the event.

Saunders and a cameraman used a single Sony PVW-637 BetaSP camcorder and a Lowell light kit. For audio, the crew used lavaliers and boom mics. Saunders says, "My advice to all videographers

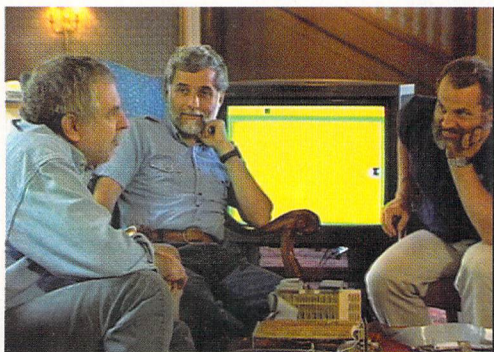
out there is to give more attention to your audio. Bad video you can cut away from, but bad audio is almost impossible to work around. It pays to be extra anal-retentive about your mic sensitivity."

To embellish the narrative, Saunders cuts in black and white photos from the era and often shows footage of the game in action. Also, Saunders miraculously found a period rock song by "Splitsville USA" about the Atari for the opening and closing theme.

My enthusiasm for this documentary intensified when I learned they used the Toaster Flyer for postproduction. Moreover, "Stella" contains a nostalgic nexus - one of the creative gurus at Atari was the late Jay Miner who also contributed to pacemaker technology and is the Father of the Amiga. Miner regarded the Video Toaster as one of his favorite hardware "hacks."

To take the viewer from the still photos to the current-day footage, Saunders frequently customized Toaster transitions - often a scan of the game cartridge that made the designer famous. Check out the entire collection of Atari wipes on Nova Design's Millennium upgrade for the Video Toaster, (or look on the *NewTechniques* website for a select few). These creative custom transitions offer ample inspiration for "rolling your own."

Projects such as Saunders' epitomizes the promise of the Toaster because it enabled him to produce a wonderful, professional show. You can order "Stella" and learn more about the project at: <http://cyberpunks.uni.cc>.



Nolan Bushnell, Ron Milner,  
and Joe Decuir reminisce

Bohus Blahut, the director of The Vantage Point, has finished his third tutorial video for ImageFX, ([www.legacymakerinc.com](http://www.legacymakerinc.com)). [bohus@xnet.com](mailto:bohus@xnet.com).





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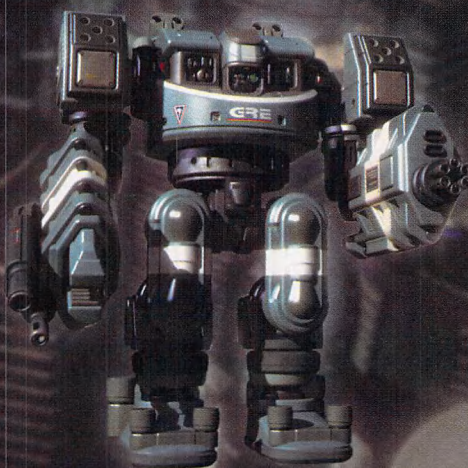
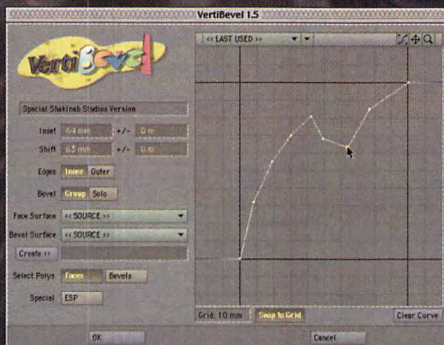
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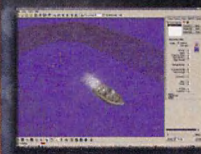
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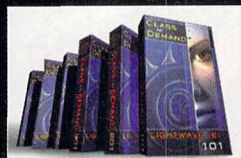
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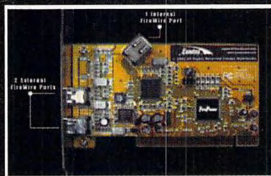
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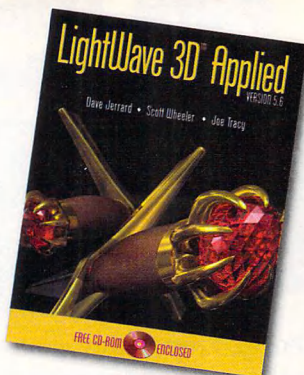
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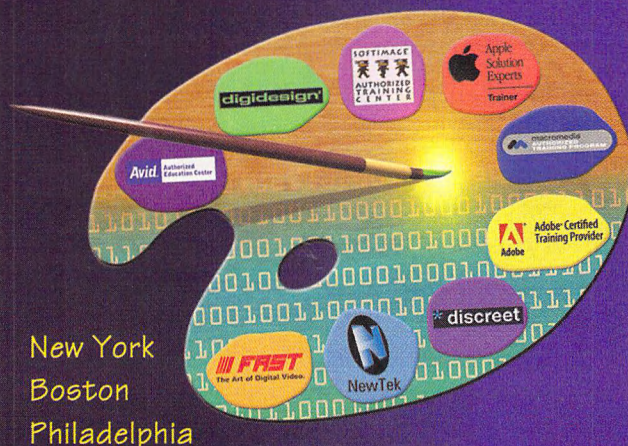
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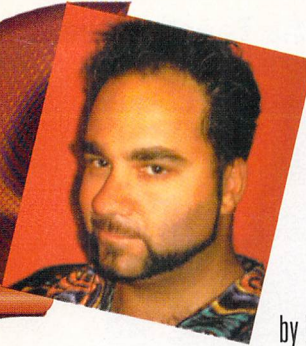
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She flipped open her guitar case and pulled out her Rickenbacker. An uncomfortable silence drifted across the room. When she asked what was wrong, the producer nervously commented, "Oh, I see you play a Rickenbacker." A little confused, she replied, "Yeah, it's a real gem." The producer looked at her wistfully and then pensively down to her classic axe and admitted, "I'm really sorry, but we were looking for someone who plays a Fender." She was stunned. "But who cares what I play?" She asked. "You liked my tape, right?"

"Absolutely," replied the producer. "But we heard that Fenders are better."

Maybe you've guessed by now that this story isn't true. Certainly no one in their right mind would ever dismiss an artist whose work they admired because of the tools they used. Would they?

Recently, a director with a big-budget animation project asked if Foundation Imaging would be willing

to do the 3D portion for him. He had always loved our work and thought it would be great to have us on board. We agreed on the deal and began planning the project. One day, while discussing the nuts and bolts of the animation process, he was startled to realize that we exclusively use LightWave. "You use LightWave for everything?" he asked. "Yup. Always have," I said. He began to hem and haw. "Are you sure LightWave can handle this project?" he inquired. "Of course," I replied. "Is that a problem?" "Well," he nervously explained, "I heard Maya was better."

I was shocked. He clearly didn't know much about 3D animation, and someone obviously had warned him that LightWave wasn't a serious software package. Only a more expensive program like Maya could handle a *really* big project. I sat him down and explained that 3D programs are all, more or less, the same. Sure, some have more bells and whistles, but in the

end, the artist bears the responsibility and deserves the credit – not the program. LightWave doesn't make bad animation – lack of talent makes bad animation. Likewise, in the right hands, even a shareware program like *Ray Tracin' Bonanza* can spit out a masterpiece.

Sadly, I have often heard people argue the merits of one 3D program over another, regardless of the particular studio's quality of work. When discussing 3D software, producers seldom are knowledgeable, but they want to *sound* like they are. If they can name the "in" 3D package of the moment and rattle off some "facts" they've heard, suddenly they feel like experts. Perhaps the producers are buying the rhetoric of the folks who make more expensive software. They claim that the cheaper tools aren't serious contenders and that a smart producer should avoid these "under-privileged" people – certainly producers understand that expensive equals quality! So, deaf to the music, they begin to make decisions like "Fenders are better."

A few years ago, high-end hardware manufacturers tried to convince people that you couldn't do any serious work on a PC, and only \$15,000 workstations could handle a project like *Babylon 5*. That argument quickly disproved itself. Now a new breed of software moguls want people to believe that you can't get serious animation from software costing less than \$10,000. Next time you run into a clown like this, just mention *Titanic* or *Star Trek: Voyager* and bask in the silence that will undoubtedly follow.





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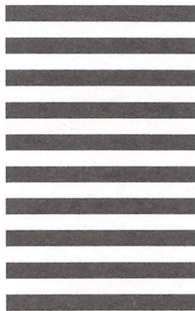
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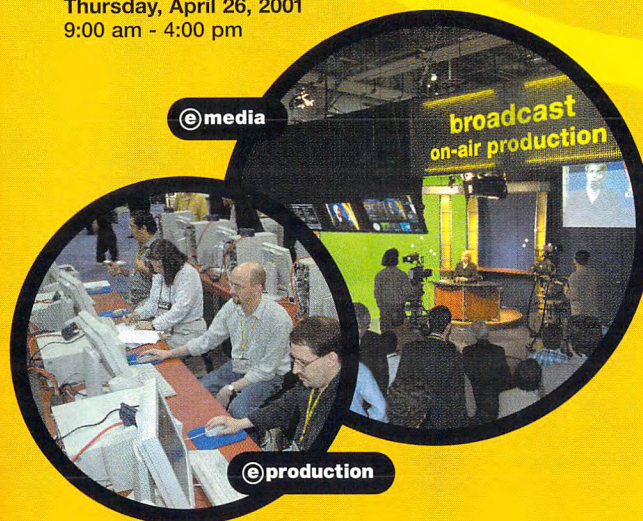
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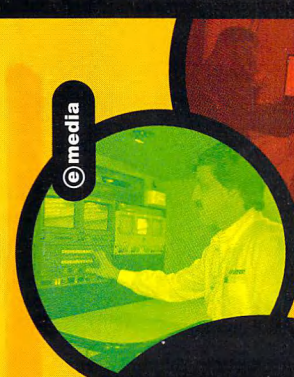


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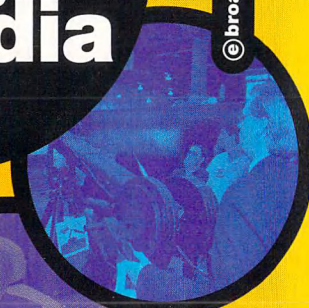


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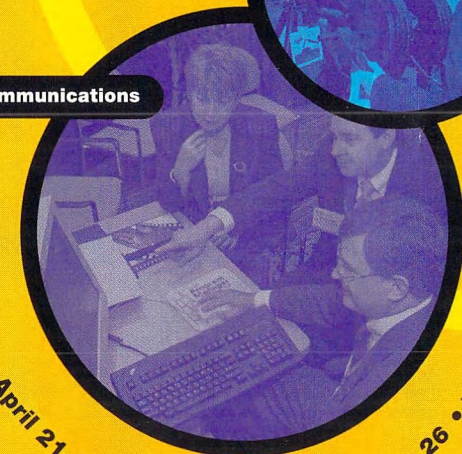


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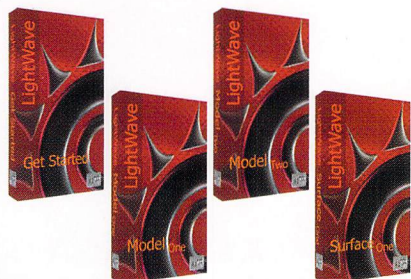
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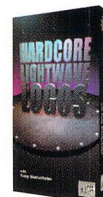
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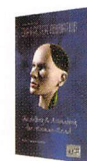
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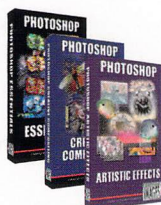
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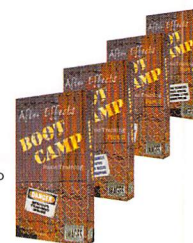
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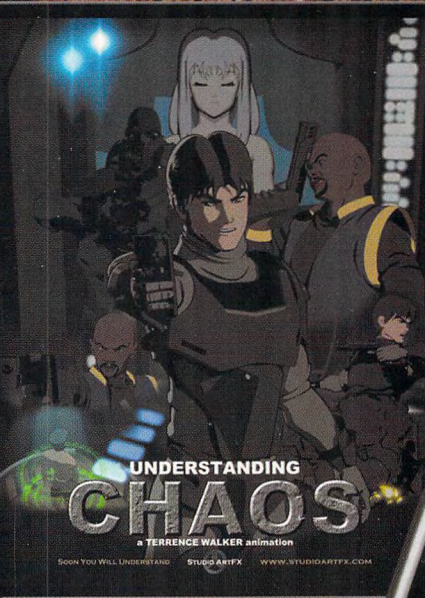
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Walker's animation, created in Aura, can be seen at  
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